Vol. XXVI. Part 12.

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The Journal of the Department of Agriculture of Victoria, Australia.

Dec., 1928.

PRINCIPAL CONTENTS

Field Day at Rutherglen

Irrigated Pastures

Manurial Experiments on Apple Trees

Orchard Summer Sprays

Notes on Amending Fertilizer Act

Crop and Fallow Competitions

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THE JOURNAL

OF

THE DEPARTMENT OF AGRICULTURE,

VICTORIA, AUSTRALIA.

CONTENTS.—DECEMBER, 1928.

		PAGE
Field Day at Rutherglen		705
Mallee Agricultural Convention—Publication of Report of Proceedings		717
Irrigated Pastures—Factors in Management	*E. T. Beruldsen, B.Ag.Sc.*	718
Caniambo Crop Competition, 1928	*P. Ryan, B.Ag.Sc.*	722
Sea Lake Crop and Fallow Competition	*P. Ryan, B.Ag.Sc.*	724
Peach Aphis and Leaf Curl—Spraying Experiments	*A. A. Hammond*	728
Orchard Summer Sprays	*H. W. Davey*	731
Manurial Experiments on Apple Trees	*F. M. Read, M.Ag.Sc., and A. G. Strickland, B.Ag.Sc.*	735
South Africa's Wool Industry		739
Amending *Fertilizers Act* 1928 (No. 3597)—Explanatory Notes	*W. R. Jewell, M.Sc., &c.*	740
Standard Herd Test—Report for Quarter ended 30th September, 1928		743
The World's Wheat Situation		763
Orchard and Garden Notes	*E. E. Pescott, F.L.S.*	764
Reminders for January		766

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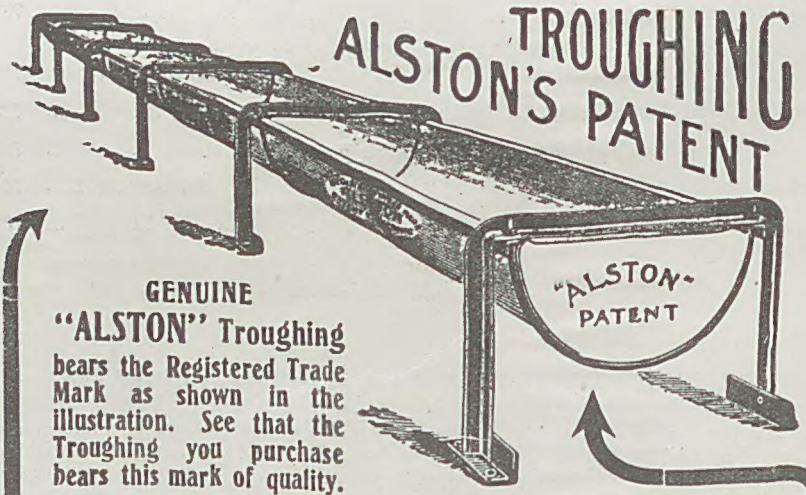

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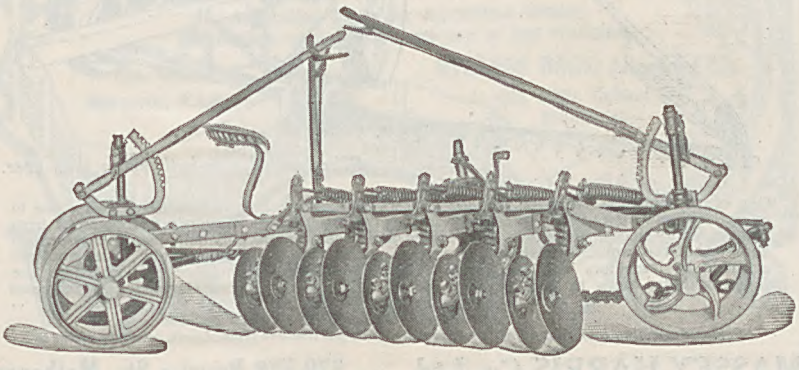

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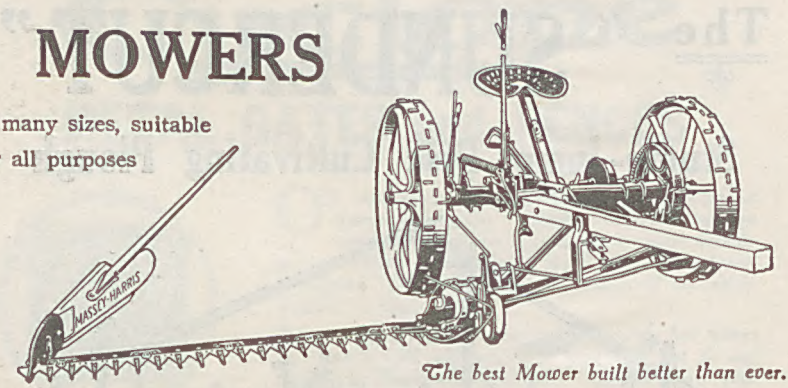

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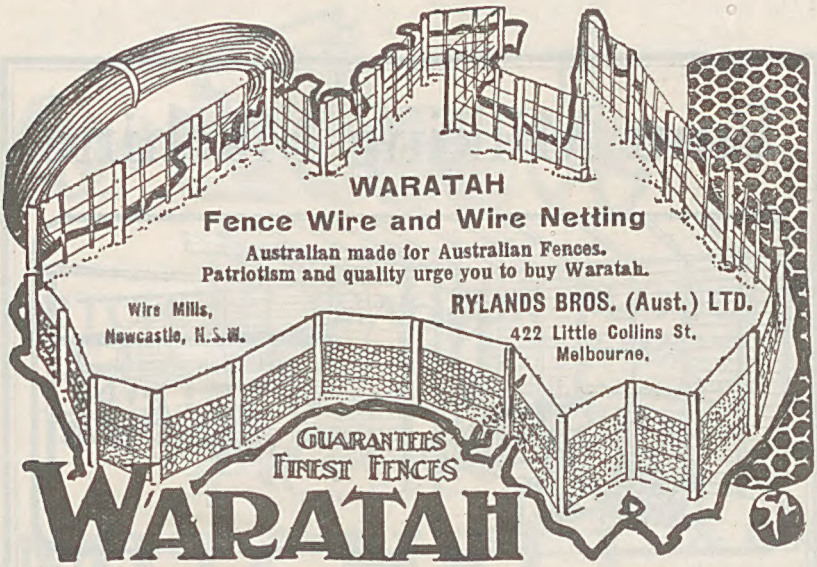

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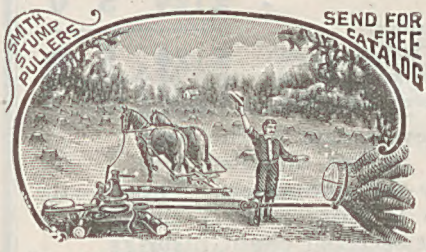

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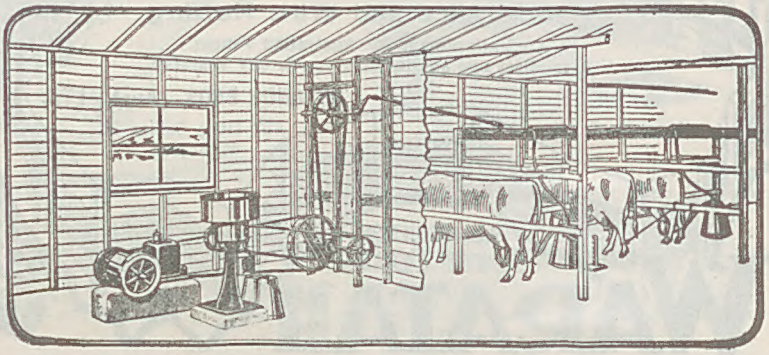

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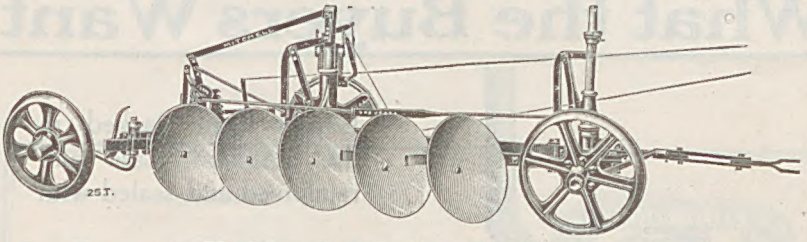

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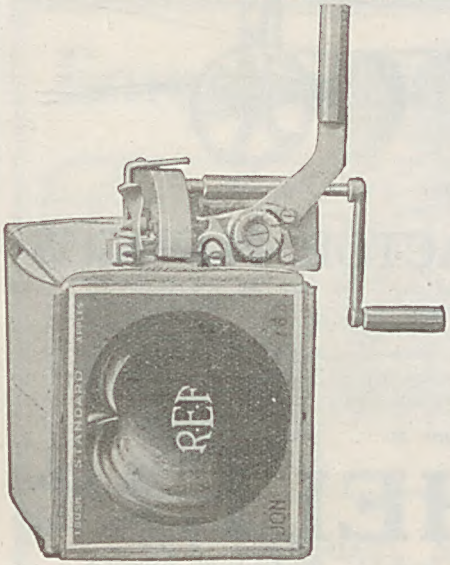

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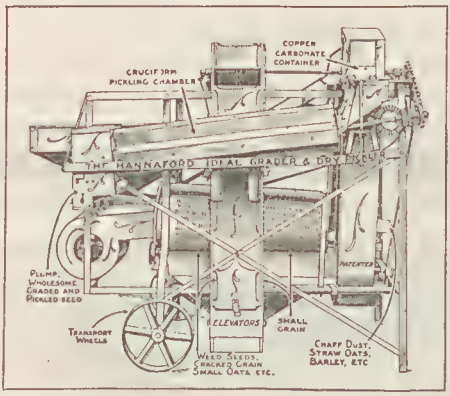

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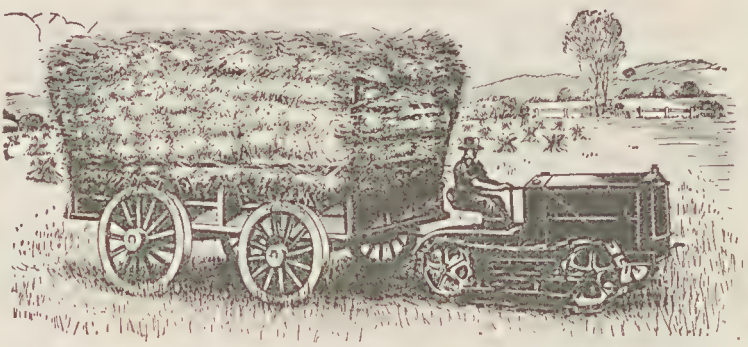

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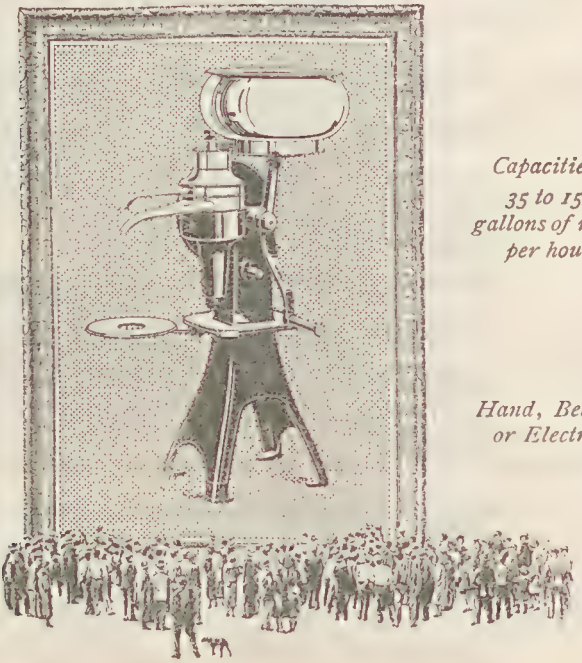

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THE JOURNAL

OF THE

Department of Agriculture

OF

VICTORIA.

Vol. XXVI. December, 1928. Part 12

FIELD DAY AT RUTHERGLEN.

FARMERS' VISIT TO STATE FARM.

Pastures and Cereals.

Many farmers from the Rutherglen and surrounding districts visited the Rutherglen State Farm last month on the occasion of the annual farmers' field day. As the seasonal conditions in the north-east were comparatively favorable, the crops on the farm had made very satisfactory growth. This was particularly the case with the earlier sown crops; all those sown before June showed promise of yielding well.

Visitors inspected the plots under the guidance of the Superintendent of Agriculture, Mr. H. A. Mullett, B.Ag.Sc., who explained that, up to the end of September, the rainfall had amounted to 27.06 inches, of which only 750 points had been registered since 1st May. The phenomenal early autumn had provided very suitable conditions for sowing operations and good germination had been obtained. Winter rains, on the other hand, had been light, but sufficient had fallen for both crops and grass, and the rains early in October had ensured good yields with the exception of the June-sown crops.

The outstanding features of the work, so far as it has gone, has been the success attained in (1) increasing the carrying capacity of pasture land; (2) in showing that lucerne would thrive on the better soils in the north-eartern district without the aid of irrigation water; and (3) the demonstration of the fact that, under the conditions at Rutherglen, it was possible to substitute certain forage crops such as oats for the bare fallow which customarily precedes the wheat crop.

The objective of the pasture improvement work at Rutherglen has been in two directions:—(1) The improvement of the carrying capacity of natural pastures, and (2) the improvement of the carrying capacity by the sowing down of suitable grasses. The present development of pasture top-dressing in Victoria is due to the work initiated at Rutherglen in 1912, when a 20-acre field of virgin natural pasture, with a carrying capacity of three-quarters of a sheep per acre, was subdivided into five

plots of equal areas and top-dressed in various ways. This experiment has been in continuous progress ever since, and the sheep-carrying capacity of each plot has been ascertained by monthly weighings. On these plots it has been demonstrated that, by occasional applications of superphosphate at the rate of 1 cwt. per acre, the carrying capacity may be increased by at least 50 per cent., and that the condition and health of the sheep on the top-dressed land is markedly superior to that of those on the untreated pasture.

Experiments with cultivated grasses commenced here years ago has demonstrated that Wimmera Rye Grass and Subterranean Clover are the most suitable for Rutherglen conditions, and, altogether, 150 acres on the farm has been sown down to this mixture. These paddocks are top-dressed systematically every three years. This has resulted in increasing the carrying capacity to an average of 2½ sheep to the acre; and recent work appears to indicate that it might pay to top-dress these paddocks annually with superphosphate at the rae of ½ cwt. per acre.

Inspecting Wheat Variety Tests—Field Day, Rutherglen.

This apparently is due to the fact that where the carrying capacity was markedly increased by means of introduced grasses, there is a greater drain on the soil phosphates than in the case of pastures with lower carrying capacity.

Attention has been given to various methods of sowing down subterranean clover, and it has been shown that satisfactory results may be obtained by sowing with a clover crop of oats, providing the oats is not sown too thickly. Where the cover crop was sown thickly the clover has suffered and the resulting stand is thinner. The most economical method of obtaining the seed of subterranean clover is from a pasture previously sown down to this plant. It had been shown that, if stock were kept from such a pasture and full seeding permitted, the dried herbage could be gathered with the hay rake, winnowed, and the seed pods obtained put through the chaffcutter. Six pounds of this material would contain approximately 1½ lb. of seed and would be sufficient to sow 1 acre.

Mr. Mullett pointed out that it was a common belief that lucerne could be grown satisfactorily in the north only under irrigation. It had

been demonstrated, however, that lucerne could be established successfully in this district on all the good soils such as creek frontages and well-drained slopes. Yields equivalent to those obtained under irrigation could not be expected, but very profitable results could be obtained with this crop. A number of farmers in the district had been successful in establishing lucerne, and Mr. A. Tyrell, whose property adjoined the State Farm, had been extending that area of his farm under lucerne until he now had 500 acres sown. Up to date, the great majority of people in the north-eastern districts had not realized the possibilities of lucerne, which, in addition to its high carrying capacity, furnished feed at a time of the year when it was most valuable. However, once people awakened to a realization of this fact we could look forward to a substantially increased acreage. In addition to those at Rutherglen, good stands had been established already at Violet Town, Benalla, and Dookie, and the areas there were being extended each year. He was satisfied, Mr. Mullett added, that lucerne would thrive on any land on which vines could be grown successfully.

Variety Trials.

Great interest was shown by the visitors in the variety tests of wheat and oats. These comprise four sections as follow:—

(*a*) *Single rows of crossbred and standard varieties* sown for stud purposes.

(*b*) *Variety Observation Plots.*

These plots are 1-100th acre in area, and each variety is sown alongside a check plot of a standard variety. The object of these plots is to observe the behaviour of new varieties under Rutherglen conditions. The produce of the plots is used to sow the larger variety tests. Each year seed for these plots is obtained from the State Research Farm, Werribee, so that uniformity of type of the various varieties grown by the Department may be maintained.

(*c*) *Variety Plots.*

Thirty wheat and twelve oat varieties are under test in plots each 1-10th acre in area, and each sown adjacent to a check plot of a standard variety. The yields are ascertained, and those varieties that warrant it are later compared in more accurate field trials.

Oats were sown on 26th April with 60 lb. seed and 140 lb. super. per acre; wheat on the 12th-16th May, with 75 lb. seed and 140 lb. super.

(*d*) *Replicated Yield Trials.*

After graduation in the foregoing plots, varieties considered true to type and worthy of exact test are compared by the most accurate method available (Beavan half-strip replicated system). Each variety is sown four times over, each time alongside a check plot of the standard variety. The varieties tested this year are Federation, Free Gallipoli, Turvey, Currawa, Major, and Yandilla King. They were sown on 9th May, with 75 lb. seed and 140 lb. superphosphate per acre. These varieties have been chosen in order to ascertain the best of the principal varieties grown in the district. When this has been determined, all new

varieties of promise will be compared in the same way. No wheat which has not successfully passed this test will be distributed as seed.

Variety Tests, Wheat.

Result, 1927.

Wheat Variety.	Yield per acre, 1927.
	Bushels.
Free Gallipoli	31·1
Federation x Major, 6914, F.3-3	30·7
Federation—Longerenong	30·3
Federation—Rutherglen	29·3
Gallipoli, 76I.	29·1
Penny x Currawa, 6655, D 1-1	28·4
Major x Currawa x Ind. 4 x Federation, 6331-311	28·1
Ranee x Rajah, 5013 E4	27·8
Ind. F x Federation, L 4119-2 (Ranee)	27·7
Nizam	27·4
Federation—Werribee	26·8
Rajah	26·4
Ind. H x Telford's, Seln 66	26·3
Major	26·2
Ghurka	26·0
Waratah	25·9
Turvey	25·8
Gallipoli x Federation, 5006.4.1	25·3
Sepoy	25·2
Yandilla King	24·8
Gallipoli x Federation, 5006.5.1	24·6
Alliance	24·6
Gallipoli x Federation, 5008.5.1	24·5
Curr. x (Ind. E x Telford's), 7800 D 7-2	24·3
Bena	24·1
Currawa x Major x Gallipoli, 5319 F 3-3	23·9
College King	22·9
Currawa	20·1

It was pointed out by Mr. Mullett that, owing to seasonal variations, results of individual years could not be considered a reliable guide as to the average yielding capacity of varieties. A more reliable indication was to be obtained from the average results of five years' tests which are appended.

Wheat Varieties—Five Years' Results, 1923-27.

Sown on well-worked fallow seed 75 lb., super. 1¼ cwt.

Variety.	Yield per Acre. Average for 5 years.
	Bushels.
Free Gallipoli	29·1
Federation	27·1
Major	25·1
Rajah	24·8
Ranee	23·7
Currawa	21·6

Permanent Rotation Trials.

The object of the tests in this field is to determine the most profitable system of farming under conditions similar to those at Rutherglen. Eleven crop sequences, comprising 30 plots, are included in these tests, and in all of them wheat is the principal revenue-producing crop. An important part of the work is the series of plots designed to determine whether, under changed conditions at Rutherglen, the customary bare fallow can be replaced by a forage crop. The amount of grazing provided and any gain or loss in live weight of the sheep are recorded.

The average yield of the wheat crop grown in each rotation system is given below.

Rotation Trials.

Rotation No.	Rotation System.	Average Wheat Yield for Eleven Years. Bushels per Acre.
1	Fallow—wheat	20·4
2	Peas—wheat	20·5
3	Rape—wheat	20·5
4	Rape—peas—wheat	22·3
5	Peas—barley—rape—wheat	20·8
6	Rye and Vetches—wheat	16·2
7	Wheat continuously	8·1
8	Sorghum (Sudan grass)—wheat	14·2
9	Pasture—fallow—wheat	18·2
10	Sorghum (Sudan grass)—peas—barley—fallow—wheat	19·0
11	Oats—pasture—fallow—wheat	18·9

From such an experiment, in which in some instances the cycle is not completed under five years, quick results cannot be expected. Nevertheless, some striking differences in growth are to be observed in the field, and in some instances the yield of wheat has already been shown to have been affected by the rotation practised. Land that has been continuously cropped to wheat, for instance, has produced an average yield of only $8\frac{1}{2}$ bushels, or about one-third of that obtained when the wheat crop has followed a bare-fallow. The substitution of a summer forage crop, Sudan grass, for the bare fallow has reduced the wheat yield by about 6 bushels per acre.

Where rye and vetches have been alternated with wheat, there has been a notable reduction in yield. In this case the reduction is partly due to the fact that Take-all affects both crops in this rotation.

When either of the forages, peas or rape, is sown in the autumn, and fed off during the winter and early spring, and the land immediately fallowed, the yield of wheat grown on this fallow apparently is not reduced. This result conforms with that obtained at the State Research Farm, Werribee. However, neither of these forages can be recommended for Rutherglen conditions, as they do not furnish satisfactory grazing returns here. Oats, as a forage crop, has not been tested in these rotations, but, judging from the results obtained at Werribee, this crop is likely to provide increased financial returns as compared with peas or rape.

Feeding Off and Green Manurial Tests.

The objects of these tests are—

(1) To determine whether the customary fallow for wheat can profitably be replaced by a forage crop.

(2) To investigate the most economical method of restoring humus to worn-out wheat soils.

This may be done by growing forages and

(*a*) Feeding them off with sheep;

(*b*) Ploughing them under as green manure.

Outline of Experiment.—The forages under test are rape, barley, peas, rye and vetches. In the first series each forage crop is sown in the autumn, and fed off with sheep during the winter and early spring, and the plot immediately fallowed. Wheat for grain is sown in the following autumn on this late fallow. Wheat is grown also after bare fallow for the purpose of comparison.

In the second series of plots the treatment is identical with the above, except that the forages are ploughed in as green manure instead of being fed off.

The number of sheep grazed on each plot, and their gain or loss in weight, are recorded.

In 1921, the wheat plots were halved, one-half being sown with wheat, and the other with oats. The effect of ploughing in and feeding off green forage crops on a following oat crop will thus be determined.

Results, Feeding Off and Green Manurial Tests.

Yields obtained with wheat grown after bare fallow and in rotation with forages fed off to sheep, and also with the same forages ploughed under (average for twelve years).

Rotation.	Average Wheat Yield for Twelve Years. Bushels per Acre.
Series 1—	
Wheat after rape—fed off	18·2
Wheat after barley—fed off	14·6
Wheat after peas—fed off	17·3
Wheat after rye and vetches—fed off	17·6
Wheat after bare fallow	18·6
Series 2—	
Wheat after rape—ploughed in	16·2
Wheat after barley—ploughed in	9·9
Wheat after peas—ploughed in	15·3
Wheat after rye and vetches—ploughed in	16·8
Wheat after bare fallow	18·1

The test is confirmatory to that made in the rotation field in showing that after rape and peas are fed off to sheep under Rutherglen conditions, the yield of wheat is quite as satisfactory as where the wheat is grown after bare fallow. Unfortunately, both rape and peas have not proved very economical to grow at Rutherglen, hence cannot be recommended for similar soils in the district. The tests confirm those at the State Research Farm, Werribee, in showing that, if barley is used

Visitors at the Field Day, Rutherglen State Farm.

as a forage crop in this way, material reduction in the yield of subsequent wheat crops is likely. So far oats has not been tested as a forage crop in this particular field, but shortly steps will be taken to do so.

One outstanding result of the test has been the failure of any of the forage crops when ploughed in to increase the yield of wheat. The unsatisfactory effect of barley when used as a green manure preceding wheat will also be noticed. The result undoubtedly is due to the presence of Take-all disease in the barley and its transference into the wheat crop.

Manurial Trials, Wheat and Oats.

Twenty wheat and twenty oat plots are embraced in this section. The plots, 1-10th acre each, are sown on land alternately under crop and bare-fallow, and the site of each plot is permanent. In respect to all other factors, such as cultivation, seeding, &c., the plots are treated as uniformly as possible. This season oats were sown on 1st May, with 60 lb. seed, and wheat on 2nd and 3rd May, with 75 lb. seed per acre.

The results from this section, showing the average yields of wheat for thirteen years, and of oats for five years, are set out in the following table:—

Seventy-five lb. of Federation wheat were sown per acre on each plot.

Manurial Trials, Wheat and Oats.

Manure Applied per Acre.	Wheat—Average Yields for Thirteen Years.	Oats—Average Yields for Five Years.
	Bushels per acre.	Bushels per acre.
Farmyard manure, 10 tons	21·1	39·6
Farmyard manure, 10 tons + lime, 10 cwt.	21·4	38·6
No manure	13·4	28·9
Super., ½ cwt.	19·8	41·9
Super., 2 cwt.	21·8	43·8
Super., 1 cwt.	20·7	45·6
Super., 1 cwt. + nitrate of soda, ½ cwt. (with seed)	23·5	47·1
Super., 1 cwt. + nitrate of soda, ½ cwt. (in spring)	22·0	47·4
Super., 1 cwt. + sulphate of ammonia, 44 lb.	22·5	47·6
Super., 1 cwt. + sulphate of ammonia, 44 lb. + sulphate of potash, ½ cwt.	20·5	47·6
No manure	12·3	30·4
Bone Fertilizer, 1 cwt.	20·1	43·3
Basic Slag, 1 cwt.	20·7	42·6
Basic Slag, ½ cwt. + super., ½ cwt.	21·6	48·3
Super., 1 cwt.	21·1	44·0
Super., 1 cwt. + lime, 5 cwt.	23·3	48·8
Super., 1 cwt. + lime, 10 cwt.	22·4	45·3
Super., 1 cwt. + lime, 20 cwt.	23·9	48·0
No manure	11·7	25·3
Super, 1 cwt. + sulphate of potash, ½ cwt.	21·0	45·8

It is evident from a perusal of these results that the application of superphosphate has given the most profitable results for wheat. The use of other manures, such as nitrate of soda, &c., in conjunction with superphosphate, apparently has given increases, and a point has been reached when consideration must be given as to whether a definite recommendation to apply nitrogen to wheat in the Rutherglen district

should not be made. The yields from plots treated with varying quantities of superphosphate indicate that it pays to apply at least 1 cwt. of super. with either wheat or oats sown on fallow. The following table shows the profit resulting from the use of the several dressings with wheat and oats:—

Profit due to use of Superphosphate.

Manure applied per Acre.	Yield—Bushels per Acre.	Increase over No Manure. Bushels per Acre.	Value of Increase at 4s. 6d. per Bushel.	Cost of Manure at 6s. cwt.	Net Profit due to Use of Manure.
			s. d.	s. d.	s. d.
Wheat.—13 years average.					
No manure ..	13·4	..	..	..	..
Super., ½ cwt. ..	19·8	6·4	28 10	3 0	25 10
Super., 1 cwt. ..	20·7	7·3	32 10	6 0	26 10
Super., 2 cwt. ..	21·8	8·4	37 10	12 0	25 10
Oats.—5 years average.					
			at 2s. 6d. bus.		
No manure ..	28·9	..	..	..	..
Super., ½ cwt. ..	41·9	13·0	32 6	3 0	29 6
Super., 1 cwt. ..	45·6	16·7	41 9	6 0	35 9
Super., 2 cwt. ..	43·8	14·9	37 3	12 0	25 3

CULTIVATION TESTS.

Cultivation Tests with Wheat.

These comprise twelve plots each 1-5th acre in area.

The object of the tests is to compare the yields of wheat sown on a series of plots tilled in various ways. A depth of ploughing test is included. Plots were sown on the 7th May, with 168 lb. super. and 75 lb. seed per acre.

The average yields of wheat from the plots for thirteen years are as under:—

Cultivation Tests, Wheat.

Average Results for Thirteen Years.

Treatment of Plot.	Yield per Acre.
	Bushels.
Ploughed 3 inches July, and well worked	20·2
Ploughed 5 inches July, and well worked	24·8
Ploughed 7 inches July, and well worked	26·3
Ploughed 9 inches July, and well worked	24·6
Ploughed 3 inches July, subsoiled, and well worked	22·7
Ploughed 5 inches July, subsoiled, and well worked	24·4
Ploughed 7 inches July, subsoiled, and well worked	24·8
Ploughed 5 inches July, and well worked	23·6
Ploughed 5 inches July, and neglected	14·5
Ploughed 5 inches October, and well worked	19·4
Ploughed 5 inches October, and neglected	17·8
Ploughed 5 inches just before seeding	9·9

Plots sown with Federation wheat 75 lb. per acre, superphosphate 1¼ cwt. per acre.

It is apparent that shallow ploughing, practised so successfully in other wheat districts, is not advisable under the conditions at Rutherglen. The yields show an improvement as the depth of ploughing increases from 3 inches to 7 inches; beyond that depth, 9-in. ploughing, a decrease is evident. Subsoiling has had no appreciable influence on the yields, and the results are in agreement with those from the depth of ploughing section. Despite the subsoiling, the deeper ploughing still shows a beneficial influence on the crop. The yields from the early and late fallowed, cultivated and non-cultivated, and non-fallow plots, afford interesting comparisons, and demonstrate convincingly the superiority of the early and well-worked fallow.

Wheat Pickling Tests.

These plots are part of an extensive series of pickling experiments being conducted by the Department at Rutherglen, Longerenong, and Werribee. The tests are designed to compare the efficiency of the different standard pickling methods, and to determine the relative efficiency of the various commercial dry-pickling powders.

Yield Trials.—The object of these trials is to compare the effect of bluestone, formalin, and dry-pickle on the germination, growth, and subsequent yield of the seed.

In this section there are eighteen plots. These are divided into three lots—six plots being sown with seed pickled in a 1¼ per cent. solution of bluestone, six with seed treated with formalin (1 in 450) and six with dry pickled seed.

It was noticed that the germination of the dry pickled seed was quicker and better than that of the seed treated with either bluestone or formalin. Following are the results from the yield plots at Rutherglen in 1927. The wheat sown was artificially infected with smut:—

Treatment.	Yield in 1927.
	Bushels per acre.
Unpickled	21·6*
Bluestone, 1¼%	26·2
Formalin, 1-450	25·7
Dry Pickle, 2 oz. per bushel	29·4

* Wheat heavily infected with smut.

In addition reinfection tests, comparison of the various commercial dry-pickling powders, and graded powder tests are being conducted.

In order that a dry powder may be an effective pickle, it should contain a high percentage of copper, but it is essential also that it should be in a very fine state of subdivision. In order to determine

the degree of fineness necessary, a test is being made on copper carbonate dusts of varying grades. There are 42 small drill plots included in this test, every alternate plot being a check plot.

Rate and Time of Seeding Tests.

This comprehensive series of plots is designed to determine the optimum period and rate of seeding for wheat in the Rutherglen district.

The average results of these tests to date indicate that maximum yields are obtained by sowing early in May with at least 75 lb. of wheat per acre.

PASTURE IMPROVEMENT.

The carrying capacity of virgin pasture in the Rutherglen district is approximately one breeding ewe to 1½ acres. In order to test the

At the Pasture Top-Dressing Tests.

possibility of increasing the carrying capacity, the following tests are being carried out:—

1. Pasture top-dressing tests.
2. Establishment of sown-down pasture, principally Subterranean Clover and Wimmera Rye Grass, when the land is thrown out to pasture after the cultivation of cereal crops.
3. Improvement of grasses and clover by selection.

Pasture Top-Dressing Tests.

An area of virgin native pasture is divided into five plots of 3¾ acres each, four of which have been top-dressed as follows:—(1) Super., 1 cwt. + lime 10 cwt. per acre; (2) super., 1 cwt. per acre; (3) Thomas

phosphate, 1 cwt. per acre; (4) super., 2 cwt. + nitrate of soda 1 cwt. per acre. These plots were manured every year from 1914 until 1920, since when the practice of manuring only every fourth year has been followed. The remaining plot has not received any manure.

Originally the plots functioned mainly as demonstration areas, but for the past seven years a record has been kept of the number of days' grazing afforded, and of any loss or gain in the live weight of the sheep. Every year marked differences in the quantity and quality of the pasture provided in the several plots are apparent. The most obvious difference to the eye is in the increased percentage of clovers present on the manured sections.

The results of grazing over the past eight years, together with botanical and chemical analyses of the produce of plots, are summarized in the following table:—

Pasture Top-dressing Tests.

Sheep-grazing Trials.

Average Results for Eight Years, 1920 to 1927.

—	Super., 1 cwt., Lime, 10 cwt per Acre.		Super., 1 cwt. per Acre.		No Manure.		Thomas Phosphate, 1 cwt., per Acre.		Super., 2 cwt., Nitrate of Soda, 1 cwt. per Acre.	
	Sheep Carried.	Lb. Gain—Live-weight.	Sheep Carried.	Lb. Gain—Live-weight.	Sheep Carried.	Lb. Gain—Live-weight.	Sheep Carried.	Lb. Gain—Live-weight.	Sheep Carried.	Lb. Gain—Live-weight.
	Per acre.	Per acre.	Per acre.	Per acre.	Per acre.	Per acre.	Per acre.	Per acre.	Per acre.	Per acre.
Average for eight years, 1920–27 ..	1·2	90	1·0	72	0·7	39	0·9	63	1·2	88
Average for four years, 1924–27 ..	1·4	129	1·2	113	0·7	52	0·9	87	1·4	129

Analyses of Mixed Pastures (1920).

Botanical Analysis.

	Per cent.	Per cent.	Per cent.	Per cent.	Per cent.
Grasses ..	21	18	65	49	39
Clovers ..	74	75	14	36	52
Weeds ..	5	7	21	15	19
		Analysis of Ash.			
Nitrogen ..	2·02	2·3	1·5	..	..
Phosphoric Acid ..	0·5	0·6	0·3	..	..
Lime ..	1·4	1·5	0·6	..	..

The figures indicate that the number of sheep it is possible to keep per acre has been increased approximately 50 per cent. on the plot that has been treated with superphosphate, and rather more where lime and super. have been applied. Further, the sheep on the manured plots have shown a higher gain in live weight per head than have those on the unmanured area.

Sown Down Pasture Tests.

Subterranean Clover and Wimmera Rye Grass have been shown to increase greatly the carrying capacity of land on the Rutherglen State Farm.

Experiments are now being conducted to discover the most economical way in which such a pasture may be established.

The following methods are being compared in a comprehensive series of tests :—

(*a*) By sowing Subterranean Clover and Wimmera Rye Grass with a cover crop of oats on well-cultivated land in the autumn.

(*b*) Similar tests without a cover crop

(*c*) By sowing Subterranean Clover and Wimmera Rye Grass on the surface of stubble land, following a cereal crop.

Improvement of Grasses by Selection.

Efforts are being made to improve the feeding qualities of "Wimmera rye grass." Many individual selections from this grass have been made and grown in stud rows and small plots. One selection that is apparently of a superior type has now been multiplied up, and is undergoing field trial on the bulk areas of the farm.

MALLEE AGRICULTURAL CONVENTION.

Publication of Report of Proceedings.

Three years ago a conference of representatives from various parts of the Mallee met at Ouyen to discuss agricultural matters of interest to Mallee farmers. A second convention, lasting two days, was held at Ouyen in October last, and a record of the proceedings is about to be issued by the *Sunraysia Daily*. Copies will be sold to the public for 1s. each (including postage), and may be had from the proprietors, *Sunraysia Daily*.

IRRIGATED PASTURES.

FACTORS IN MANAGEMENT.

By E. T. Beruldsen, B.Ag. Sc., Irrigation Field Officer.

It is only in recent years that a conception of the great value of mixed pastures has been gained in the irrigation districts of Victoria. In the past few years, however, there has been a substantial increase in the area devoted to this purpose, and new areas of irrigation land are continually being sown down with mixed grasses and clovers.

Dairy farmers in the irrigation districts for a long time have felt the need of a supplement to lucerne in the feeding of their stock, and there is no doubt that a stand of mixed grasses and clovers meets this need.

Lucerne is the best fodder crop grown under irrigation; but, maximum production of lucerne is attained, and the longevity of the stand assured, only when the lucerne is cut, either to feed as green stuff, or for hay. Grazing of lucerne certainly shortens the life of the stand. On the other hand, mixed pastures undoubtedly are long lived under grazing conditions. Another great advantage is that they supply a variety of feed—in other words, the much desired balanced ration—as well as being very productive. A carefully chosen mixture will provide a continuity of feed throughout the year, the growth being somewhat checked during the winter months.

Fifteen years' experience on the Research Farm at Werribee has provided interesting and important information in regard to the establishment and management of irrigated pastures and the tests there have been so successful that the Department has no hesitation in recommending the further development of pastures under irrigation as a supplement to lucerne.

Preparation of the Land and Sowing the Seed.

In this article it is proposed to deal with the care of the pasture after it has been established; but, as the actual preparation of the land, and the sowing may very well be included under the heading "management," a few points with regard to these features of the work will be dealt with first in the hope that they may prove useful to those who have not already established a mixed pasture, and who may intend to do so, either on new ground, or by replacing a thinned-out lucerne stand.

One cannot stress too much the importance of careful preparation of the land. This should be allowed to lie in fallow for a few months at least, so that the seed may be sown in a clean and firm seed bed. Autumn and spring sowing, when the ground is moist and warm, both give satisfactory results, but in northern districts, autumn sowing is preferable.

The seed is mixed with the manure on the day of sowing, and the mixture may be broadcast on the ground by having the tubes of the drill hanging free from the hoes. A chain harrowing, or brush harrowing will then afford sufficient cover for the seed. An alternative method is to drill in the ordinary way through the manure box, with the hoes of the drill just let into the ground. In this case, provided there

is a sufficiently good tilth, a subsequent harrowing should not be necessary. Good results are also obtained with some of the broadcasting machines available on the market.

A mixture of grasses and clovers may be a very complex one or it may be simple. However, the following mixture will be found suitable, and satisfactory:—

Perennial Rye Grass	10 lb. per acre.
Italian Rye Grass	3 lb. ,, ,,
Cocksfoot	3 lb. ,, ,,
Cow Grass (perennial red clover) ...	2 lb. ,, ,,
White Clover	1 lb. ,, ,,
Alsike Clover	1 lb. ,, ,,
Subterranean Clover	1 lb. ,, ,,

Strawberry clover, although expensive, is a very valuable asset, and a small proportion should be included, if possible. About 1 lb. of lucerne seed per acre might also be included.

Careful grading is very important, and in the subsequent treatment of a mixed pasture much trouble will be avoided if attention has been given beforehand to this work. A proper distribution of water is essential, and this can be achieved only by careful grading and check-banking. Generally, the border system of irrigation is adopted.

Watering.

Once a mixed pasture has been established, it is very necessary to give it proper attention in respect to watering and manuring. Also a system of judicious grazing must be adopted to secure the best results. When it is remembered that the grasses and clovers mentioned above are not indigenous to Australia, but have been introduced from European countries, where generally cooler and more moist climatic conditions exist than in Australia, it will be seen at once that it is all-important to try, as far as possible, to reproduce these conditions artificially. In our irrigation districts the judicious and adequate application of irrigation water is the only factor which can induce those conditions.

Compared with lucerne, grasses and clovers are shallow-rooted, and, if moist conditions are not sustained, the growth will be checked, and the plants will soon have a wilted appearance. Probably grasses and clovers do not require such deep-penetrating waterings as lucerne, but they do require frequent watering, and, in the middle of summer, they should be irrigated at least every three weeks, and preferably once a fortnight.

If, at the time of irrigating, it is known that the water will not be available again for some weeks, then every endeavour should be made to give the pasture a good soaking to carry it over the longer period between waterings. In many districts this penetrating watering can be achieved only by going over the same ground two or three times, with short intervals between applications. That is to say, pasture once watered can be gone over again on the following day with marked benefit, and possibly the day after that again. This practice of giving supplementary waterings may not always be practicable, on account of difficulties in obtaining water. Again, in porous soils this policy could not be adopted, as probably the first watering would be sufficient, and

supplementary waterings would be excessive. The irrigator can obtain a rough estimate of the penetration, after the first application of water, by digging his shovel into the ground. It will surprise many who do this to find that the water has not soaked so deeply into the ground as they had imagined.

To obtain optimum growth, a pasture should have abundance of water carefully applied. One advantage of a mixed pasture is that, in low-lying country where water tends to lie long enough to ultimately kill lucerne, many of the grasses and clovers will persist under these conditions, and actually flourish. In autumn the pasture can be watered to stimulate the winter growth without much fear of harm being done if heavy rain should follow.

The abnormally dry winter and spring experienced this season brought the growth on several pastures practically to a standstill. In these instances irrigation should have commenced early, to make up for the lack of winter rainfall.

Top-dressing.

The next important factor in pasture management is top-dressing. Most Victorian soils are deficient in phosphates. When a crop of hay is taken off, or animals are grazed on a pasture, the store of phosphates in the soil is still further depleted in helping to make the hay itself, and in building up the frames of animals. It is necessary, therefore, that the grower should put back into the soil something to make up for this drain on its mineral resources. Phosphoric acid, in the form of superphosphate, is readily available to the plant, and can be assimilated immediately. On irrigated pastures an annual dressing of 2 cwt. of superphosphate per acre gives very satisfactory results. This dressing may be applied in autumn, or when most convenient; it may be drilled in, put on with a spreader, or broadcast by hand.

There are other manures containing phosphates which are sometimes used, such as bone meal, bone fertilizer, basic slag, and rock phosphate. However, the phosphoric acid in these manures is not immediately available to the plant, and it may be years before any benefit can be derived from their application.

There is a common and erroneous opinion that continued applications of superphosphate will, sooner or later, impoverish the soil. On the contrary, there is a residual effect, resulting in gradually increasing fertility, since phosphoric acid is very closely held by the soil particles and is not washed or leached out by water to any great extent. Apart from increased growth, other benefits derived from top-dressing are the improved palatability of the pasture, the improved health of stock, and the fostering of the good grasses and clovers to the detriment of the poorer fodder plants and of weeds.

So far little benefit has been derived from the application of nitrogenous fertilizers to irrigated pastures; but, in some cases, the application of small quantities of a nitrogenous fertilizer, such as ammonium sulphate, has been attended by increased winter growth of the grasses, apparently without detriment to the development of the clovers. Eventually the question of the application of nitrogenous manure may become a much more important one than it is at present

Grazing Methods.

Systematized grazing is also essential if the best results are to be obtained from a mixed pasture. Immature grass is much more nutritious and rich in protein than grass which is allowed to reach maturity. Heavy grazing, with short intervals of rest, is the best method to adopt, and, to facilitate this, efficient subdivision is required. Without adequate subdivision, it will be found that some patches are eaten off close to the ground, while others are allowed to grow rank, with consequent waste. The grower should aim to prevent the grass from reaching maturity before being fed off. On the other hand, too close grazing in the middle of summer is undesirable, as the removal of sufficient covering growth tends to make the ground dry out rapidly. If these few points are kept in mind, and a little judgment exercised the grower should have no difficulty in determining when to put stock on a pasture paddock and when to take them off.

An occasional light harrowing will be found desirable to break up and scatter the droppings left by stock.

After two or three years the varieties of grasses and clovers will have reached a state of stability. Certain of the varieties will be dominant, and others will have practically disappeared. For example, if lucerne has been included in the mixture, there will be only a few plants persisting. Italian rye grass will give a bulk of feed only at the start. Cow-grass may or may not persist, depending on conditions. White clover, subterranean and strawberry clover will probably be dominant. Subterranean clover, although an annual, reseeds itself freely, and every winter and spring provides excellent feed.

It will often be noticed that a strain of grass or clover seems to be well suited to the environment and tends to develop and spread. These strains are well worth watching and often warrant propagating. For example, there is a strain of white clover at Tongala which seems to be spreading naturally, and which makes excellent growth. Also at Swan Hill there is a strain of strawberry clover, much stronger in structure and development than the ordinary strawberry clover; this strain is also very valuable.

As time goes on, a pasture which is well cared for should gradually improve, and indeed it is worth looking after, for, with proper attention, it will last a lifetime.

Summary.

In conclusion, the essential factors in successful management of irrigated pastures may be summarized as follows:—

1. Always keep the ground well supplied with moisture. Carefully apply adequate quantities of water.

2. Top-dress every autumn with 2 cwt. of superphosphate per acre.

3. Graze heavily, but intermittently. Subdivide paddocks and do not cause waste.

CANIAMBO CROP COMPETITION, 1928.

Report of the Judge, P. Ryan, B.Ag.Sc., Inspector of Agriculture.

The acreage sown to wheat in the Caniambo district is not large, but the entries in the local competition, though few in number, were of such a high standard that they would have held their own in any competition in the State.

The soils in the district are mostly stiff clays which offer considerable resistance to the percolation of water. The result is that in a normally wet winter, there is danger of the crops suffering from an excess of moisture during their early stages of growth. For best results the district requires a comparatively dry winter with good rains in the late spring and, in this respect, the dryness of July, August and September, which adversely affected other wheat-growing centres, was advantageous to Caniambo.

The yields obtained this year are sufficient to indicate what the land is capable of, but nevertheless a high degree of skill and judgment in cultivation is necessary if satisfactory returns are to be obtained. Fallowing is absolutely essential, but in the production and maintenance of the mulch careful regard must be paid to the nature of the soil. A finely divided mulch, such as is sought by a Wimmera wheat-grower, is quite unsuitable for this land, as it would run together and set very hard after a shower of rain. Knowing this danger, some farmers after ploughing in July, August or September, leave their fallows untouched until shortly before seeding time. This, of course, largely nullifies the value of the fallow, and is a practice that must be condemned as quite undesirable. By the exercise of judgment in the choice of implements and the time of working, it is possible to maintain a mulch that is loose enough to prevent loss of moisture, and yet cloddy enough to avoid the danger of setting.

The conservation of moisture is not so important at Caniambo as in the drier parts of the wheat belt, but it must be emphasized that fallowing involves other factors which are of the utmost importance in the successful cultivation of the wheat crop. The proper preparation of the seed-bed can be obtained only by early working, which also has an important effect in stimulating the activities of useful bacteria in the soil and in breaking down the mineral plant food to such forms as are available to the plant.

The cultivation trials conducted over a period of thirteen years at the Rutherglen State Farm are worthy of careful study by Caniambo farmers, as the conditions at these two places are sufficiently similar to warrant the inference that the results obtained at Rutherglen would also be applicable to Caniambo. These results are as follow:—

	Bushels per acre.
Ploughed 3 inches July and well worked	20·2
Ploughed 5 inches July and well worked	24·8
Ploughed 5 inches July and neglected	14·5
Ploughed 5 inches October and well worked	19·4
Ploughed 5 inches October and neglected	17·8
Ploughed 5 inches just before seeding	9·9

The results demonstrate convincingly that even in a district with a slightly higher rainfall than Caniambo, fallowing is necessary if payable

yields are to be obtained. In addition, they show that early fallow is better than late, and that well-worked fallow gives much higher returns than a neglected one. From these results it is also apparent that shallow ploughing, practised so successfully in other wheat districts, is not advisable under the conditions at Rutherglen. So far as Caniambo is concerned, ploughing to a depth of 5 inches is recommended, except on those soils where such a practice would mean bringing crude subsoil to the surface.

Stress has been laid on the preparation of the fallow, because in the course of a tour of the district instances came under notice where land had been ploughed for fallow, but at the time was a mass of wild oats and saffron thistles.

The average rate of seeding of the competition crops was 66 lbs., with 111 lbs. of super. per acre. The dressing of manure is considered satisfactory, but the rate of seeding probably could be increased with advantage on well prepared fallow to at least 75 lbs. per acre. Copper carbonate pickle has become popular in the district, as growers have found it advtantageous in giving a good and quick germination, partilarly when conditions are unfavorable through an excess of rain.

There were six entries in the crop competition, and it was a difficult task to separate the three leading crops. Messrs. J. Mactier and K. Cole were placed equal first with crops of Waratah and Baldmin respectively, while a crop of Marshall's No. 3 exhibited by Messrs. W. B. Tonks and Sons was a very close third. The two winning crops promised to yield well, and were true to type. Mr. Mactier's crop was particularly good in respect to absence of weeds and freedom from disease, and gained a slight advantage over Mr. Cole's entry in this respect, but the latter crop was more even.

It was estimated that Messrs. Tonks and Sons' crop of Marshall's No. 3 would give a heavier yield than either of the two winning crops, but it lost points under the other headings, particularly for unevenness, partly due to want of care in drilling.

Awards.

Best 20 Acres of Wheat Crop.

Competitor.	Variety.	Estimated Yield.	Trueness to Type.	Absence of—		Evenness.	Total.
				Weeds.	Disease.		
Maximum Points ..	.. .. ..	**35**	**20**	**15**	**15**	**15**	**100**
K. Cole	Baldmin ..	30	19	14	13½	14½	91
J. Mactier ..	Waratah ..	30	19	14½	14½	13	91
W. B. Tonks & Sons	Marshall's No. 3	33	18	13½	13	12½	90
K. Cole	Federation ..	28	17	13	14	14	86
W. B. Tonks & Sons	Joffre ..	32	16	12½	13	12	85½
J. G. Johnston ..	Free Gallipoli	26	17	12	13½	12	80½

Mr. Mactier ploughed his land with a mouldboard plough 4½ inches deep in August, harrowed it immediately, and then cross-harrowed it. The fallow was graded with a road grader to fill in depressions in August, cultivated with the Wimmera scarifier in September, and again in February. It was harrowed in front of the drill, and the crop

sown early in May at the rate of 80 lbs. of seed and 100 lbs. of super. per acre. The seed was pickled with copper carbonate. The land was harrowed after the crop was sown.

Mr. Cole ploughed his land with a mouldboard plough 3 inches deep in July. It was cultivated with the spring-tooth cultivator at the end of October, at the beginning of March, and again just before the crop was drilled at the latter part of April. Dry-pickled seed was sown at the rate of 63 lbs. per acre, with 90 lbs. of super.

The land on which Messrs. Tonks and Sons' crop of Marshall's No. 3 was sown was ploughed 4 inches deep with a mouldboard plough in August, harrowed in September, cross-scarified in October, harrowed in February, scarified later in the same month, and cross-scarified in April. The crop was sown on 1st May with 80 lbs. of dry-pickled seed and 115 lb. of super. per acre.

SEA LAKE CROP AND FALLOW COMPETITION.

Report of the Judge, P. Ryan, B.Ag.Sc., Inspector of Agriculture.

When allowance is made for the adverse climatic conditions experienced, the standard of the crops entered in the Sea Lake Crop Competition must be regarded as highly satisfactory. It is true that the yields will be disappointing as compared with what the crops promised early in the season, but if the rainfall record is carefully studied the recovery of the crops after passing through three months of extremely dry weather must be regarded as surprisingly good.

In the course of several days tour of the district, not one absolute crop failure came under notice, while there were not a few crops which would have been regarded as creditable in even a normal season.

The weather conditions at Sea Lake during the year were typical of those experienced throughout the Mallee district. The rainfall in the late summer and early autumn was well above average, and the splendid rains received at this time gave the fallows a good soaking. Although May and June were comparatively dry, the germination and early growth were all that could be desired, and it needed only normal spring rains to ensure record yields. Unfortunately July, August and September, were exceedingly dry, and the crops began to wilt. When the dry weather continued after the middle of September there seemed little hope that the crops would yield more than seed, but as a matter of fact when the rain came at the end of September, the crops on the whole responded splendidly. At the time of judging most of them were short, but well headed and, being comparatively free from weeds and disease, promised to give what, in the circumstances, must be regarded as satisfactory yields.

In a season with such an unusual and somewhat erratic distribution of rainfall, it was not altogether surprising that some results opposed to general experience should be obtained. For example, in several cases farmers had the experience of stubble crops yielding as well as and, in some cases, better than those sown on well prepared fallow. In some instances the better showing of the non-fallow crops was due to the fact that they were later than the fallow crops, and therefore had not advanced to the critical stage before the dry spell broke, with the result that they responded better when the rains came. It would be deplorable if, influenced by the freak results of an exceptional season,

farmers were to relax their efforts in the proper preparation of their land. Fortunately, judging by the standard of the fallows entered in the competition, Sea Lake farmers realize that early and careful fallowing is essential if wheat-growing under their light rainfall is to be something more than a gamble with the weather.

The only disease noticeable to any great extent in the competition crops was flag smut, which had thinned out a few of them rather severely. This thinning had a less serious effect on the yield this season than it would have had in a normal season because, owing to the dry conditions, the thinner crops were much better headed and promised to yield better than where heavy sowing had been practised.

As many growers still confuse flag smut with loose smut, it may be advisable to briefly describe this disease.

Flag Smut.

Flag smut appears as black streaks on the leaves, which become curled and twisted and may break off. On examination, these black streaks are found to be spores or seeds of the fungus causing the disease. The vitality of the plant is impaired, and in many cases the ear is not formed, but becomes a mass of diseased tissues. The twisted and curled leaves dropping to the ground are the main source of infection for the next season. The withered portions may be blown about by the wind, or carried by men, horses or implements. The spores can pass uninjured through animals, and the droppings of animals fed on chaff cut from an infected crop are often the cause of the occurrence of the disease on new land. The infection takes place at the seedling stage, and as the main source of infection is in the soil, pickling the seed with formalin, bluestone, or copper carbonate will not prevent the disease. The only method of control is to ensure the destruction of the spores or seeds of the disease before another crop is available for attack. A good stubble burn will reduce their numbers considerably, and an endeavour must then be made to induce the remainder to germinate prior to the sowing of the next wheat crop. Oats are immune from flag smut; therefore if the infected paddock is sown to oats, no host is provided on which the fungus can live. Since they are not capable of living independently, any spores that develop will be starved out. This condition will apply also if the land is kept under well worked fallow, and in addition the condition of such fallow encourages the germination of the spores.

The question of the application of these general principles of control will depend on the circumstances of the grower and the severity of the attack. If a crop is only lightly affected, probably a stubble burn and a good early fallow will suffice. In the case of a very severe attack, it would be advisable to introduce at least one oat crop prior to the fallow.

Generally speaking, the crops were below expectations in the matter of trueness to type; there were far too many strangers in most entries, and barley also was fairly common. The most popular varieties grown in the district appear to be Joffre, Penny, Sepoy, Rance and Free Gallipoli. Fortunately growers seem to realize the inadvisability of growing a large number of varieties on their farms, as it was rare to find more than three varieties on any one property. Dry pickling has become very popular in the district, and practically every competition crop was treated in this way.

There was a good deal of difference in the quality of the drilling in the exhibits. Most of the crops showed a high standard of workmanship, but in a few cases there were very serious drill misses, which are not only unsightly, but reduce the yield and form a harbour for weeds.

The Competition.

There were 21 entries in the crop competition, and first prize was taken by Mr. Walton McManus with a crop of Joffre and Penny. Considering the seasonal conditions, this was an excellent crop. It was well headed, fairly dense and even, and comparatively free from weeds and disease. It lost points for type, the Penny in particular showing quite a number of strangers.

Second place was awarded to Mr. Metherall with a crop of Sepoy which, while a little thin and uneven, was beautifully headed, and was considered the heaviest yielding crop in the competition. It lost points for unevenness and the presence of wild oats. Quite contrary to general experience this year, Mr. Metherall's crops were poorer on the sand hills than on the flats.

Third prize was won by Mr. A. E. King with a crop of Joffre and Free Gallipoli.

Competitor.	Yield.	Trueness to Type.	Absence of Weeds.	Freedom from Disease.	Evenness.	Total.
Possible points	**35**	**20**	**15**	**15**	**15**	**100**
OPEN CROP COMPETITION.						
Best 100 acres of wheat.						
Walton McManus (No. 1) ..	30	16	14	14	14	88
R. B. Metherall (No. 1) ..	32	18	11	14	11	86
A. E. King (No. 1).. ..	26	17	14	14	13	84
E. J. Brennan	27	17	13	14	11	82
J. Mills	23	18	13	14	12	80
Walton McManus (No. 2) ..	23	19	13	12	12	79
J. G. King (No. 2).. ..	22	16	14	13	13	78
R. B. Metherall (No. 2) ..	22	18	13	13	11	77
R. B. Metherall (No. 3) ..	22	18	13	13	11	77
R. H. Colliver	21	18	12	14	11	76
A. E. King (No. 2) ..	20	17	13	13	13	76
Austerberry Bros. (No. 1) ..	21	17	13	13	12	76
G. E. McManus (No. 1) ..	18	17	13	13	13	74
Austerberry Bros. (No. 2) ..	20	18	11	13	11	73
F. Olney	21	17	12	11	12	73
J. Mills	18	17	13	13	12	73
J. G. King (No. 1).. ..	18	16	13	14	12	73
McFarlane Bros. (No. 2) ..	20	16	11	13	13	73
McFarlane Bros. (No. 1) ..	18	16	13	13	12	72
G. E. McManus (No. 2) ..	17	17	13	13	12	72
J. Kiely	17	17	11	13	13	71
SOLDIERS' SECTION.						
Best 100 acres of wheat grown by returned soldier.						
J. Kiely	17	17	11	13	13	71

Points allotted for yield do not represent the estimated yields in bushels per acre.

Fallow Competition.

There were 24 entries in the fallow competition, and most of them reached a high standard of excellence. Owing to the late rains, the fallows showed a higher moisture content than is usual at this time of the year. The most common fault was the failure to form an even seed bed, quite a number of entries showing ridges.

First prize was awarded to Mr. F. E. McManus, who won by a narrow margin from Mr. Walton McManus and Mr. C. Gilmour.

BEST 100 ACRES OF FALLOW.

Competitor.	Moisture.	Mulch.	Absence of Weeds.	Cultivation.	Total.
Possible points	25	25	25	25	100
G. E. McManus (No. 1) ..	23	24	23	24	94
Walton McManus (No. 1) ..	24	23	23	23	93
C. Gilmour	23	23	24	22	92
A. E. King	23	23	22	22	90
Cousins Bros.	23	22	23	22	90
Walton McManus (No. 3) ..	23	21	23	23	90
Walton McManus (No. 2) ..	23	21	22	23	89
E. J. Brennan	22	22	24	21	89
G. E. McManus (No. 2) ..	22	22	23	22	89
J. G. King	21	21	24	22	88
King Bros.	21	23	23	20	87
R. H. Colliver (No. 4) ..	21	23	22	21	87
A. Metherall	21	21	23	21	86
P. R. Bell	20	22	23	21	86
E. Methweall	22	20	23	20	85
W. Mills	20	21	23	20	84
— Schodde	21	22	21	20	84
Austerberry Bros (No. 2). ..	20	20	23	20	83
F. H. Manuel	20	20	22	21	83
R. H. Colliver (No. 3) ..	23	21	18	21	83
R. H. Colliver (No. 2) ..	23	21	17	21	82
Austerberry Bros. (No. 1) ..	19	20	23	20	82
McFarlane Bros.	21	18	22	20	81
R. H. Colliver (No. 1) ..	22	21	16	21	80

Mr. G. E. McManus ploughed his land 3 inches deep in June with a mouldboard plough, harrowed it in July and again in early October.

Mr. Walton McManus ploughed his fallow 2½ inches deep in July, cultivated it with the combine in August, harrowed it in September, cultivated it with the combine in mid-October, and again at the end of October.

Mr. Gilmour's fallow was worked 2 inches deep with the combine in August, and again cultivated with the same implement at the end of September, and also at the end of October.

PEACH APHIS AND LEAF CURL.

SPRAYING EXPERIMENTS.

By A. A. Hammond, Senior Orchard Supervisor.

Spraying experiments were carried out last August at the School of Primary Agriculture, Burnley, and at the orchard of Mr. H. A. Mundy, Templestowe, for the purpose, chiefly, of testing the relative values of different petroleum oils as ovicides, and also to test their efficiency when combined with a fungicide and an insecticide.

It has long been recognized that an ovicidal spray is essential for the effective control of the Green Aphis. The eggs of this aphis are deposited in the axils and crevices of the fruit buds in the late autumn. These eggs hatch at what may be termed the pink-bud stage in spring. The time of hatching is, to a large extent, governed by the temperature and the season. I have never discovered any live green aphis on the buds before they began to move in the spring.

If a fungicide, combined with an ovicide, is applied at this stage, both the leaf curl and aphides will be controlled. The fungicide used in all the experiments under notice was Bordeaux mixture. This was combined with ordinary fuel oil, common lubricating oil, and with a patent oil emulsion called "Kleenup." Nicotine sulphate was added to the oil-Bordeaux combination in two of the mixtures used, but it did not increase the efficiency of the mixture.

The fuel oil and lubricating oil were emulsified with a 3 per cent. bluestone solution and milk of lime (10 per cent.), before being added to the Bordeaux.

The method of preparing an emulsion of petroleum oils is as follows:—

Place 4 gallons of oil in a suitable vessel; add 3 gallons of bluestone solution and then the milk of lime; stir and force mixture through spraying nozzle into another vessel. The strength of the emulsifying agents is as follows:—

1 lb. of bluestone dissolved in 3 gallons of water = 3 per cent. solution approximately.

1 lb. of fresh lime, dissolved in 1 gallon of water, gives a 10 per cent. solution.

The "Kleenup" readily mixes with the Bordeaux when previously thinned by the addition of 2 gallons of water.

The formulae of the spraying mixtures were as follows:—

No. 1.—
1 gallon Shell oil BD_3A.
20 gallons Standard Bordeaux mixture.

No. 2—
1 gallon Shell fuel oil.
20 gallons Standard Bordeaux mixture.

No. 3—
1 gallon "Kleenup."
20 gallons 4.4.40 Bordeaux mixture.

No. 4—
Same as No. 1, plus ¼-pint nicotine sulphate.

No. 5—
Same as No. 2, plus ¼-pint nicotine sulphate.

Burnley Experiment.

Eight rows of peach trees (five in each) were treated. Three rows were left as a check. The varieties in each row, including the check, were similar. The varieties were Pump's Seedling, Zerbe's No. 1, and Lady Palmerston. An investigation of the treated trees was made on the 6th September, when 200 buds from each row were examined. The treatment given, and the results obtained are set out in Table No. 1 below:—

Table No. 1, Showing Treatment of Trees at Burnley School of Primary Agriculture for Control of Peach Aphis and Leaf Curl, and the Results Obtained.

Row.	Treatment.	Result.
Nos. 1 and 2	Formula No. 1 (see above). Spray applied 8th August	Four buds of 200 examined infected with green aphis. No black aphis
Nos. 3 and 4	Formula No. 4 (see above). Spray applied 8th August	Five buds of 200 examined infected with green aphis. No black aphis
Nos. 5 and 6	Formula No. 5 (see above). Spray applied 8th August	Two buds of 200 examined infected with green aphis. No black aphis
Nos. 7 and 8	Formula No. 3 (see above). Spray applied 15th August	Four buds of 200 examined infected with green aphis. No black aphis

Some of the trees in the check rows were badly affected with black aphis, and about 20 per cent. of their flower buds were infected with green aphis.

Experiments at Templestowe.

The experiments at Mr. Mundy's orchard, at Templestowe, varied but slightly from those carried out at Burnley. Details are given in Table II. below:—

Table No. II., Showing Treatment of Trees at Templestowe for Control of Peach Aphis and Leaf Curl.

No. of Trees Treated.	Treatment.	Date Treated.
18	Formula No. 1 (see above)	2nd August
9	Formula No. 2 (see above)	2nd August
5	Formula No. 5 (see above)	2nd August
10	Formula No. 3 (see above)	15th August

Similar varieties were treated in each experimental plot. No check trees were left. The peach trees other than those being used for the experiment were sprayed with miscible red oil (1 in 20) and Bordeaux mixture, applied separately.

An examination of trees in the experimental plots was made on the 20th September. At this time they were in leaf. Mr. Mundy was present, and assisted in checking the results.

The green and black aphis were effectively controlled in all treated trees, there being very few affected leaves. The fuel oil, as at Burnley, gave slightly better results than the other mixtures. Here, too, the addition of nicotine sulphate did not increase the efficiency of the mixture.

The trees treated in the experimental plot were as free from green aphis infestation as adjacent trees treated by Mr. Mundy with miscible oil used separately, and were cleaner than trees in other parts of the orchard. This, however, may be of little significance, as the soil, situation and variety are factors that have to be taken into consideration.

Judging from these experiments, I would be inclined to say that nicotine is certainly of no value as an ovicidal spray, and would be useful only in the case of black aphis, or where spraying was delayed till some of the green aphis had hatched, which, in southern districts in a season such as that experienced last spring, would be when the blossoms were at the late pink stage.

Cost.

The cost of the various spraying mixtures used was as follows, eliminating the cost of the fungicide, which is constant:—

No. 1 formula: 80 galls. ... 10s.
,, 2 ,, ,, ,, ... 2s. 7½d.
,, 3 ,, ,, ,, ... Not known, probably 16s. to 20s.

The cost of miscible red oil would be 13s. for 80 gallons, apart from the extra cost of labour in applying the ovicide and fungicide separately.

The miscible oil can be combined with Bordeaux mixture by diluting oil to 20 gallons and adding it to a 12-8-60 Bordeaux with the agitator running. It is important that the Bordeaux be an alkaline mixture, otherwise the oil will curdle.

The leaf curl fungus was effectively controlled by the dual-purpose spray.

Conclusion.

In conclusion, I would point out that the spraying must be done thoroughly.

Uniformity of action by orchardists is also essential to successful control, as when the green aphis increases to plague numbers, winged viviparous females appear early in myriads. These winged females would soon spread to clean orchards. It follows, therefore, that the use of effective control measures must be general, otherwise the work of some is nullified by the neglect of others.

At Burnley, where the check trees became rather badly infested, it was noticed that infestation increased much more in the treated plots than at Mr. Mundy's orchard, where no trees were left untreated.

ORCHARD SUMMER SPRAYS.

H. W. Davey, Chief Orchard Supervisor.

The question of summer sprays is an important one, and the mention of them will immediately set many thinking of arsenical sprays for use against the larvae of the codling moth, for it is such sprays that are most commonly applied during the summer months. However, in addition to spraying for codling moth during the warm weather, there are other serious insect pests to be controlled, such as scale insects, plant bugs, pear slug, aphids, &c. Fungicidal applications for the control of late black spot, brown rot, and other diseases must also be attended to.

In looking back over the last few years it is realized that, although very great advancement has been made in the control of orchard pests (both insect and fungus), there still remains much research work to be done for the purpose of discovering some surer methods of preventing, or at least minimizing to a greater extent, the annual losses of fruit-growers, due to their crops being destroyed by insects or by fungi.

It is not so very many years ago that apple and pear growers were applying Paris green (aceto arsenite of copper) for the control of codling, and using a small lever pump for its application, and, although fair results were often obtained, Paris green was not altogether satisfactory, owing to its being held only in suspension in water: thus when globules of spray mixture formed on the fruit and foliage, the Paris green would precipitate itself to the bottom of the globule of water, and when two or three of these coalesced, they dripped off the tree, carrying the poison with them. Owing to the power pump, and to the improved spraying formulas now followed, it is probable that man's power over the organisms that attack his trees was never greater than at the present time. Yet, in spite of this greater knowledge, we still find that some insects can defy man in their struggle for existence, for, if given the right conditions, they can hold their position against all the efforts to control them. Unfortunately, this has been demonstrated during the present season by the serious attacks by green aphis on peach trees.

Peach Aphis.

To enable an insect to reach plague numbers, such as the green aphis has done this season in Victoria, all conditions must be favorable to its increase, and when given these, the aphis will soon demonstrate what it is capable of doing.

The chief reasons for the enormous increase of these insects this season are as follow:—

(1) The continued wet spring weather; (2) the absence of hot winds; (3) the number of wet days which prevented spraying being done at the right time; (4) windy weather on fine days, so making the spraying of trees extremely difficult, and frequently only partially effective; (5) the delays caused by the foregoing reasons allowed aphis to increase to plague proportions causing leaves to curl, and the curled leaves gave further protection to the aphids from contact insecticides applied for their destruction; and (6) the very rapid increase of these insects by parthenogenesis.

The phenomenon of parthenogenesis may be described as reproduction by direct growth of germs from egg cells without fertilization. This allows such an insect as the green aphis to increase to prodigious numbers in a very short space of time. Professor Huxley has stated that the produce of a single aphis would in the course of ten generations, supposing all individuals to survive, contain more ponderable substance than 500,000,000 stout men.

The life history of green aphis may be described as follows:—Eggs are laid in autumn, and in spring agamic aphids are hatched from these eggs. These females produce young parthenogenetically, and this may be repeated for many generations. As the season advances, and especially as the tree on which they are feeding weakens, many winged females appear. Still later in the season, sexual individuals are produced. Pairing then takes place, and fertilized eggs are laid; these overwinter and hatch in the spring.

From this it can readily be understood that the most important spray against these insects is an ovicide for the purpose of destroying the eggs before they can hatch in early spring. Four gallons of miscible oil to 80 gallons of water should be used for the purpose. If later on aphis appear, these should be immediately sprayed with nicotine sulphate—1 pint to 80 gallons of water, to which 3 lb. of soft soap has been added. Further sprayings with this material should be given as the necessity for them arises.

In combating green aphis, the most important part of the campaign is, first to spray with an ovicide, and second to spray again, but on the second occasion with nicotine sulphate, so as to destroy any aphis sheltering in the expanding buds; a later spraying should be given to prevent aphids curling the leaves and entrenching themselves in same.

Owing to the early appearance of winged females, it becomes essential that there should be uniformity of action amongst growers for the control of the pest, for if a few peach trees are allowed to remain untreated, there is every probability that these will re-infest all clean trees in the neighbourhood.

In a spring such as the one just experienced everything has been in favour of the rapid increase of aphis, the weather conditions being extremely adverse to successful application of sprays, owing to wet or windy conditions prevailing at the time when the most effective spraying should have been carried out. The disastrous visitations in the Goulburn Valley and elsewhere is almost entirely due to this circumstance. When once the leaves become badly curled, it is very difficult, if not impossible, to combat aphis by the application of insecticidal sprays.

Codling Moth.

The calyx sprays on apples and pears, already applied for codling control, should now be followed up and continued at intervals during the summer months, every 20 or 30 days, according to weather conditions. The last application for late varieties should take place about the middle of March. The usual strength at which arsenate of lead is used for control of codling larvae is 5 lb. of paste to 80 gallons of water; if the powder form be used, 2½ lb. is sufficient for 80 gallons of water.

In addition to the spraying with arsenate of lead, all fallen fruits should be collected, and if diseased, they should be destroyed and all other necessary steps taken for the control of the pest.

Root Borer.

In some localities these beetles are now plentiful. Crinoline traps should be placed around stems of affected trees, when large numbers of the beetle can be captured, and thus prevented from ascending the trees for the purpose of depositing their eggs. A trap was figured and described in this *Journal* for September last.

The cageing of these beetles, instead of killing them, has at times been suggested. The object would be to rear large numbers of parasitic wasps, whose larvae infest the bodies of many of these beetles, and these parasites would materially assist in the control of the borer.

Cherry Slug.

Arsenate of lead spray should be applied to all early ripening cherry trees as soon as possible after the fruit has been harvested, for the purpose of destroying the larvae of the cherry slug. In the case of mid-season and late varieties, the spray should be applied soon after the fruit has set. The imported Saw Fly is extremely partial to the leaves of the Kentish cherry, and trees worked on this stock should always receive special attention owing to their habit of suckering.

All deciduous fruit trees, and especially those growing near wind-breaks of pine or other coniferous trees, must be watched for Red Spider. If the spiders are numerous, the trees should be sprayed with nicotine sulphate at usual strength. Then, during the next dormant period, affected trees should be sprayed with lime sulphur at 1 in 10, or else with miscible oil emulsion at 1 in 20.

Lime sulphur, or any form of sulphur, is fatal to mites of all kinds.

Rutherglen Bugs.

The Rutherglen Bug, so frequently and wrongly called the Rutherglen Fly, is a pest very difficult of control in some seasons. In the northern districts, where the bugs are always the most troublesome, care should be taken to have clean cultivation in the orchard, also as little harbour as possible for them on headlands, channel banks, &c. Attention to such matters will greatly minimize attacks from these insects.

The most effective spray we have at present to check the Rutherglen Bug is as follows:—Miscible oil ½ gallon, nicotine sulphate ¾ pint, phenyle 1 pint, soap 1 lb., and water 80 gallons.

The bugs are extremely active during the heat of the day; therefore, the best time to apply the spray is either first thing in the morning or in the evening.

If small heaps of dry grass or similar material are placed at intervals between the rows of trees, quantities of the insects will shelter in them at night, and by lighting these early in the morning great numbers of the bugs may be destroyed.

Brown Rot in Stone Fruits.

In summers of high humidity Brown Rot may cause very serious losses, both while fruit is on the trees, and later while it is in transit to markets. Wet weather is favorable, not only to infections, but also helps towards the abundant production of spores on twigs, blossoms and

fruits, so that warm, moist conditions will tend to the rapid spread of the disease. On the other hand hot, dry conditions will hold the disease in check.

The first control spray should be applied when buds begin to swell. Lime sulphur, with a strength at first of 1 in 9, should be applied, and later, just before the buds burst, it should be applied at a strength of 1 in 25.

In seasons favorable to late development of the disease, further sprayings are necessary. For summer spraying commercial lime sulphur at 1 in 100, or the self-boiled lime sulphur 8.8.50, are the most effective. The last spraying should be given about a month before the fruit ripens.

The following is the formula for self-boiled lime sulphur:—8 lb. lump lime, 8 lb. sulphur, 50 gallons of water. Slake lime in a wooden vessel and add sufficient water to make a thin paste; add sulphur, running it through a fine sieve; mix well with lime putty, and when thoroughly wetted, add a little more water. There should be sufficient heat to cook some of the sulphur, if the mixture be allowed to stand for a few minutes. Dilute to make 50 gallons. This is a safe summer spray.

It is of the first importance that all fruits infected with brown rot fungus be collected and destroyed.

Shot Hole, or Apricot Scab.

Shot Hole or Apricot Scab attacks blossoms, leaves, twigs, and fruit. When the leaves have been attacked small areas are killed and fall away, which gives the leaves the characteristic appearance of having been riddled by shot; hence the name, Shot Hole.

The Bordeaux spray—12.8.80—(12 lb. bluestone, 8 lb. quick lime, and 80 gallons water) is the approved fungicide for controlling this disease. Two applications should be given—one when the trees are at the dormant stage, the second when the buds are showing pink.

As lime sulphur is liable to injure apricot trees, it is inadvisable to use this fungicide.

Leaf curl of peach can be effectively controlled by Bordeaux—12.8.80—if applied at pinking stage.

Black Spot of Apple and Pear.

The standard Bordeaux spray and lime sulphur are effective sprays for the control of this disease. For the more tender-skinned varieties of apples and pears, lime sulphur is favoured, as it does not blemish the fruit. Two sprayings should be given, the first at the early pink stage, and the second when the petals are falling.

Excellent results have been obtained in the past from lime sulphur when applied at the early pink stage, at a strength of 3 gallons to 80 of water, with a second application, at petal fall, at a strength of 2 gallons to 80 of water, and a third spraying fourteen days later with lime sulphur (1½ gallons to 80 of water).

For late Black Spot, lime sulphur (1 gallon to 80 gallons of water) is a safe spray. Apple foliage is tender this season; therefore, in applying lime sulphur, the spraying should be done on a fine cool day, or early in the morning, for if applied during hot or showery weather, burning is likely to take place.

MANURIAL EXPERIMENTS ON APPLE TREES.

By F. M. Read, M.Ag.Sc., Horticultural Research Officer, and A. G. Strickland, B.Ag.Sc., Science Field Officer, Horticultural Division.

In the past, field trials in the manuring of fruit trees have in most cases been inconclusive. This has not only been the experience in Australia; it somehow seems to be world-wide.

Yields of control plots in various parts of the same tract will often differ as much amongst themselves as will the yields of fertilized and unfertilized plots.

However well planned field trials may be, the results can hardly be considered of absolute reliability. Although it is impossible to obtain perfect accuracy, it is possible to fix the limits of error, and thus determine whether differences obtained are due to the treatment applied, or to unavoidable errors. In other words, whether the differences are significant.

Inevitable errors must be recognized, and while reducing them by every possible precaution, we must at the same time measure their probable amount.

In horticultural experiments the question of "probable error" is more important than in any other agricultural field trials, owing to the fact that only a relatively small number of individuals can be included in a plot.

Variability of Yields of Fruit Trees.

There are many factors bringing about casual variability of yields of fruit trees under field conditions.

The inherent variability of the trees is one of great importance, as we can include only a limited number of trees in a plot. In agronomic experiments the number of plants taken is usually so large that inherent variability of individual plants ceases to be a factor of importance. This is not so with experiments on fruit trees.

Many factors of environment are beyond the control of the experimenter, e.g.:—

1. Variation in soil and subsoil (which may be apparently uniform).
2. Unequal prevalence of diseases and insects.
3. The effect of the season, which in the case of fruit trees may materially affect the crop not only during a current season, but also in subsequent years.

Probable error in respect to field crop experiments has received the attention of a number of investigators, but there has been little work of a similar nature on fruit trees.

In America, Batchelor and Reed have carried out extensive studies into the nature and extent of the variability of yields of fruit trees under field conditions, and the bearing of this on the reliability of plot trials. The following is a summary of their deductions:—

1. *Size of Plot.*—As the number of trees per plot is increased, the coefficient of variability decreases ,but not in proportion to the increased number of trees per plot. Little is gained by having plots larger than eight trees.

2. *Replication.*—Heterogeneity of apparently uniform soil is another great cause of variability. Greater reliability may be obtained by a systematic repetition and distribution of plots throughout the experimental area. They regard four repetitions of an ultimate plot as the safe minimum.

3. *Nature and Magnitude of Probable Error.*—In some cases the probable error of comparison between plots may be so large that relatively large differences must be evident between treated and untreated plots for a reasonable assurance that the differences are due to the factors being experimented upon. Any small difference between two tree plots should be considered with caution before attributing it to the differential treatment.

4. *Shape of Plot.*—Except in the case of large plots, the shape is immaterial.

Probable Error.—By means of individual tree records it is possible to determine the optimum size of plot; that is, the size of plot which will give the least probable error. Experiments in the past indicate 8-12 trees as the optimum. Verification of this work should be possible in the proposed experiments.

Use of Probable Error in Interpretation of Results.—From the foregoing it is evident that it is advisable to determine before commencing an experiment the probable amount of error which is to be expected.

Some error is inevitable, and without some knowledge as to the extent of that error, conclusions based on an experiment may be unreliable.

Proposed Experiments.

It is considered that preliminary investigations on the degree of probable error would best be followed by manurial tests of a comparatively fundamental nature. That is to say, in the present state of our knowledge it is wise to confine ourselves for the time being to a study of the general effects of the main types of fertilizers on apple trees before tackling the deeper problems of time and rate of application, and the best form in which each type of fertilizer may be applied.

The following series of plots would then seem to meet the case:—

Plot 1. No manure.
2. Nitrogen.
3. No manure.
4. Phosphate.
5. No manure.
6. Potash.
7. No manure.
8. Nitrogen, potash, and phosphate.
9. No manure.
10. Nitrogen and phosphate.
11. No manure.
12. Nitrogen and potash.
13. No manure.
14. Potash and phosphate.

It would be satisfactory if we could apply the manures in the form of nitrate of soda, superphosphate, and sulphate of potash; and to apply, as will be explained later, an equivalent quantity of each. A plot unit should consist of eight trees, and the whole experiment to be carried out in triplicate.

Details of the Experiments.

To carry out the suggestions embodied in the previous paragraph from 700 to 1,000 trees of the same variety and age, and with little variation in size and bearing capacity, would be required. It has been found impossible to secure such numbers in the commercial orchards at our disposal, and a less ambitious scheme has of necessity been adopted for the first year.

Plots 1-8 have been laid out in duplicate on each of two orchards in the Upper Beaconsfield district, namely, those of Mr. W. H. Brown (Jonathans, 14 years old), and Captain F. Griffin (Granny Smith's, 12 years old), the only two suitable orchards available at the time the experiment was begun.

The object of the trials in these cases will be to see what results, if any, follow on the application of any one of the three classes of fertilizers singly, and when all three are applied together for a period of years. At the present time growers are entirely in the dark as to the specific effect of these fertilizers.

Lack of space precludes, for the time being, a study of the effect of the different combinations of them.

In each orchard there are sixteen plots, and except for minor details the arrangement in both is similar. In Captain Griffin's orchard the number of trees available necessitated the reduction of the plot unit to six. In Mr. Brown's orchard a plot consists of eight trees.

The plot treatments are as follow:—

Plot 1. No manure.
2. Nitrogeneous manure.
3. No manure.
4. Potassic manure.
5. No manure.
6. Phosphatic manure.
7. No manure.
8. Complete manure (Nitrogenous + Potassic + Phosphoric).
9. No manure.
10. Complete manure.
11. No manure.
12. Phosphatic manure.
13. No manure.
14. Potassic manure.
15. No manure.
16. Nitrogeneous manure.

Thus it will be seen that the series 1 to 8 is duplicated in plots 9 to 16, and that there are as many control or no-manure plots as there are manure plots.

Guard Rows.

Every plot is separated from adjacent plots, or other orchard trees not included in the experiment, by a guard row. Trees in guard rows are given a half dressing of manure on each side according to the plots they separate. For example, trees in a guard row between a nitrogen plot and a no-manure plot receive a half dressing of nitrogen on the side

facing the nitrogen plot, and no manure on the other side. If separating potash and nitrogen plots, they receive a half dressing of potash and a half dressing of nitrogen respectively, on the sides facing the plots in question.

It must be remembered that guard trees do not enter into the experiment; they are merely buffers between plots.

Plot Dressings.

In order to test the three plant foods—nitrogen, potash, and phosphorus—we have applied an "ample" dressing to the plots in question. To arrive at this ample quantity, which is, after all, purely arbitrary, we reasoned as follows:—

Let us assume that nitrogen, potash, and phosphorus are absorbed as the ions NO_3', K' and PO_4''' respectively; and that in the three classes of fertilizer it is really these ions which are the effective portions.

It is fully realized that the ideal mixture of two or more manures may not consist of an equal number of effective ions of each; in other words, that the plant is not likely to absorb all ions in equal quantities, and this, of course, suggests a line of further experiments much more difficult than the one we are first attempting.

In the meantime, however, it is first necessary to determine which of the fertilizing ions have any effect at all when applied to fruit trees singly or in combination on the soils in question.

It is suggested that for the most logical means of comparison, in the limited state of our knowledge, manures be applied in such quantities as will provide for an equal number of effective ions in each case.

To do this, we must have an arbitrary starting point, and 3 cwt. per acre of nitrate of soda, approximately 3 lb. per tree, has been chosen.

On this basis, quantities of nitrate of soda, sulphate of potash, and superphosphate have been calculated from the manufacturer's analyses, so that there will be an equal number of effective ions, whether it be on the nitrate, potash, or super. plot.

These quantities, which we term "ample dressings," are as follow:—

Nitrogen plots	3.3 lb. of nitrate of soda per tree.
Potash plots	3.4 lb. of sulphate of potash per tree.
Phosphorous plots	11.0 lb. of superphosphate per tree.

Galvanized iron containers were made to hold the correct quantity of each manure required per tree, and they greatly facilitated the work, as each tree was manured separately.

Application of Lime.

The general appearance of leguminous green crops grown in the Upper Beaconsfield district strongly suggests that the soils are very acidic, and analyses have supported this conclusion. In general, it might be said that the soils vary in reaction between P.H. 5 and P.H. 6. Where heavy liming has been carried out, it has been found possible to raise this reaction to between P.H. 6 and P.H. 7 with marked beneficial results. In the general treatment of the experimental areas, therefore, top-dressing with lime is to be a regular practice, and the opportunity is being taken to determine by periodic estimations of the hydrogen ion concentration, how much lime is required to raise the reaction to about P.H. 6.5, and maintain it at that figure. Already 2 tons of lime per acre have been applied to the whole area.

Tree Census.

A detailed census of all plot trees has been taken, and figures representing the size, number of main arms, and health of each individual tree have been recorded. These census figures will provide a valuable reference basis.

Observations.

The following observations will be made, and also any others which suggest themselves from time to time:—

1. Total yield of each tree, excluding guard rows.
2. Sizes of fruit picked from each tree.
3. Weight of total prunings removed from each tree.
4. Date of first blossom break on each plot.
5. Date of estimated full bloom, i.e., 50 per cent. of the flowers in blossom.
6. Date of last blossom to break.
7. Comparative estimates of the quantity of blossom set on each tree, and the percentage of these which set fruit; those estimates to be expressed generally as follow:—

   Very heavy.
   Heavy.
   Medium.
   Light.
   Very light.
   No blossom.

8. Date of breaking of leaf-buds on each plot.
9. Date leaves begin to fall on each plot.
10. Date of complete defoliation.
11. General observations on health of the trees, including colour of leaves, vigour of growth, incidence of diseases, &c.
12. The keeping quality of the fruit in cool store.

Over a period of years it is hoped that a close study of the data obtained will yield some definite information.

SOUTH AFRICA'S WOOL INDUSTRY.

The Capetown correspondent of the Chamber of Commerce Journal, London, states that the total number of all sheep in the Union is for the first time in excess of 40,000,000. The quantity of wool exported during the twelve months ended June, 1928, is estimated, on a grease basis, at approximately 270,000,000 lb., compared with about 247,000,000 lb. in 1926-27. It would appear that not only the number of sheep, but the average yield per sheep is increasing. With regard to the future, if the present satisfactory price of wool is approximately maintained; it seems likely that the production of South African wool will undergo considerable further expansion during the next few years, as there is undoubtedly room for further expansion of wool-growing in many districts of the Union where it is as yet comparatively little practised, while the ultimate potentialities of development in Rhodesia and South-West Africa are very great.

AMENDING FERTILIZERS ACT 1928 (No. 3597).

EXPLANATORY NOTES.

(*W. R. Jewell, M.Sc., F.I.C., F.A.C.I., Agricultural Research Chemist.*)

Any legislation controlling the quality and sale of fertilizers is necessarily of interest to the farming community, since such legislation is enacted primarily for their protection. The Amending Fertilizers Act, recently passed by Parliament, makes considerable modifications to the principal Act, and the following explanatory notes are offered so that the purchaser may understand the effect of these modifications on the fertilizers he purchases and on the conditions of their sale, and also to help manufacturers and vendors to understand the principal provisions of the Act as they affect their businesses:—

The Fertilizers Act 1915, which has been on the statute-book for some thirteen years without amendment, has, on the whole, proved effective in regulating the sale of fertilizers, in ensuring that they conform with guarantee, and, generally, in protecting the purchaser. Further, by exercising certain powers in regard to registration of brands, registration has been refused in certain cases where the fertilizer in question was not considered satisfactory, either as regards price or quality. In this way the farmer has been protected from exploitation, and has been saved from much useless expenditure.

However, in the administration of the Act it was found that certain sections were so worded as to have meanings contrary to the intention of the Act, to the extent that successful administration was handicapped. In other sections the phraseology lacked clearness, and the meaning was somewhat ambiguous. The amending Act was designed to remedy these weaknesses by simplifying the diction, and by removing certain anomalies, and to strengthen the legislation dealing with the quality of bonedust. Further, the amending Act definitely makes it an offence to sell an unregistered fertilizer, and provides adequate penalties for such offences. This will prevent any person from flouting the Act by selling a fertilizer unregistered and unguaranteed.

Bonedust.

A bonedust must now consist of disintegrated bones, and must contain at least 19 per cent. phosphoric acid, instead of 15 per cent., as was provided in the principal Act. This new standard precludes the selling of low-grade animal fertilizers as bonedust, and prevents the breaking down of genuine bonedust with inferior material, as was possible when the phosphoric acid standard was 15 per cent. Experience has shown that an average quality bonedust contains over 20 per cent. phosphoric acid, therefore the standard of 19 per cent. is very reasonable.

As the degree of fineness of a bonedust governs the readiness with which it becomes available to plants, it is obvious that a very coarse bonedust is not desirable. The amending Act, therefore, states that any bonedust must contain at least 50 per cent. fine material passing through a 30-mesh sieve, which should ensure that all bonedusts are reasonably finely ground. Fertilizers not complying with these minimum requirements as regards phosphoric acid and fineness will not be registered as bonedusts. The information to be stated on bonedust labels remains as at present.

Bone Fertilizers, etc.

In the case of fertilizers of animal origin mixed with other materials (e.g. bone fertilizer), the labels, in addition to information at present required, must show the nature and amount of such other materials, i.e., they must state the percentage of gypsum, marl, superphosphate, rock phosphate, &c., in the mixture. With such information on the label the farmer should know exactly what he is buying, and it should be impossible to misrepresent a fertilizer of this kind as being a pure bonedust.

Definition of the Word "Sell."

In order to simplify procedure, and to enable proceedings to be taken against the actual offender, the definition of "sell" has been widened to include offering or exposing for sale, having in possession for sale, dealing in or agreeing to sell, &c.

Deficiency Allowances.

Deficiency allowances have been entirely altered. Under the principal Act, if the total phosphoric acid was not deficient by more than 1.5 per cent., no action could be taken even though the valuable water soluble phosphoric acid might be very much below guarantee. Further, the fixed deficiency allowed in the principal Act, irrespective of the percentage of an ingredient guaranteed, was far from satisfactory. For instance, in the case of nitrogen, the deficiency allowed was 0.5 per cent., whether the amount guaranteed was 20 per cent. or 1 per cent. If 0.5 per cent. were guaranteed, all of it could be omitted without liability to prosecution as the allowed deficiency was 0.5 per cent. A sliding, percentage deficiency allowance, varying with the amount guaranteed, is much sounder and, with certain provisos, is incorporated in the amending Act.

Briefly, it is now an offence if a sample is found to be below guarantee in nitrogen, phosphoric acid or potash (either in any of the several forms in which they occur or in total) as set out below:—

(*a*) if the deficiency is less than .2 per cent., in no circumstances has an offence been committed;

(*b*) if the deficiency amounts to .75 per cent., an offence occurs.

(*c*) if the deficiency is less than .75 per cent. but exceeds .2 per cent., an offence is committed if the said deficiency exceeds 5 per cent. of the guaranteed amount of nitrogen or potash or 7 per cent. of the phosphoric acid, either as total or in any of the several forms in which these ingredients are present.

The following examples may illustrate these cases, where it is assumed that the guarantee is 6 per cent. nitrogen:—

(1) Deficiency found—.18 per cent. No offence, under (*a*).

(2) Deficiency found—.80 per cent. Offence, under (*b*).

(3) Deficiency found—.40 per cent. Offence, under (*c*) above, as the deficiency exceeds the minimum .2 per cent. and also exceeds 5 per cent. of the guaranteed 6 per cent. nitrogen (which amounts to .3). If the deficiency found amounted to .25 per cent.. there would be no offence, as this deficiency, although exceeding the minimum .2 per cent., does not exceed 5 per cent. of the guaranteed 6 per cent. (i.e. does not exceed .3).

The penalties for an offence under this section have been slightly increased.

Samples.

In the past it was necessary to forward to the manufacturer one of the three samples taken at any official sampling. This involves unnecessary work and this sample will in future be handed to the person signing the labels on the bottles at the time of sampling.

Under the principal Act, before a prosecution could be launched it was necessary to have the third sample analyzed by an analyst nominated by the Minister. This was an unusual provision involving unnecessary work and considerable delay. The Act has now been amended so that one part of the sample shall be analyzed by the Department, one part shall be for the manufacturer or vendor and the third part for production in Court so that, in case of dispute, the Magistrate may order that it be analyzed by an independent analyst. The Fertilizers Act is thus, in this respect, brought into line with other Acts regulating the sale of commodities.

Registration of Brands.

Some of the particulars to be stated on applications for registration of fertilizers are amended, the chief amendment relating to "retail price." The "retail price" is now made more specific in that, when the fertilizer is manufactured in Victoria, it shall be the retail price per ton free on rails at nearest station, and, when imported, free on rails Melbourne. The amendment makes "retail price" quite definite and, as "unit values" are computed on retail price, these unit values are accordingly more reliable.

Power is now given to publish in this *Journal* any of the particulars as to raw materials, &c., set out on applications for registration. At times this information may be of considerable interest to purchasers.

Selling Unregistered Fertilizers.

The principal Act contains no direct provision for dealing with persons who sell unregistered fertilizers. They might have been proceeded against in a roundabout way for contravention of a section respecting labels, but even so, the penalty imposed was quite inadequate, as the system of registration of brands is the essence of the Fertilizers Act. It has now been made an offence to sell an unregistered fertilizer, and suitable penalties have been provided. For a first offence, the penalty is not less than £10 and not more than £50, and for any subsequent offence, not less than £50 and not more than £100.

Conclusion.

The foregoing are the main provisions of the new Act, which also includes some minor amendments not worthy of elaboration here. Manufacturers and vendors directly interested are advised to obtain a copy of the Act that they may be conversant with all its sections. It is proposed to bring the Act into operation on the 1st March, 1929, thus allowing ample time for the disposal of present stocks and labels affected by these amendments.

Generally speaking, the quality of fertilizers manufactured and sold in Victoria is quite satisfactory, and it is only in rare exceptions that manufacturers do not keep fertilizers up to guarantee. The amending Act, coupled with the principal Act, should ensure that this satisfactory state of affairs is not only maintained but improved.

STANDARD HERD TEST.

Report for Quarter ended 30th September, 1928.

In the following is set out the records of all cows which completed a lactation during the quarter. The number is 385, of which 255 qualify for the certificate.

The amount of butter fat required for qualification varies according to the age of the animal (up to 5 years at time of calving), the tandards being as follow:—

Junior 2 year old (under 2½ years at time of calving)	200 lb. butter fat.
Senior 2 year old (between 2½ and 3 years at time of calving)	225 lb. butter fat.
Junior 3 year old (between 3 and 3½ years at time of calving)	250 lb. butter fat.
Senior 3 year old (between 3½ and 4 years at time of calving)	275 lb. butter fat.
Junior 4 year old (between 4 and 4½ years at time of calving)	300 lb. butter fat.
Senior 4 year old (between 4½ and 5 years at time of calving)	325 lb. butter fat.
Mature cow 5 years and over	350 lb. butter fat.

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
J. Anderson, jr., Lyndhurst	6	5	Jersey ..	Lady Monica 14th of King's Vale	Mature	14118	2.10.27	273	19½	8,163	4·51	367·87	350	335
				Dolly 4th of King's Vale ..	Jr. 4 yrs.	16583	3.10.27	273	13	7,140	5·23	373·04	300	312, 308
				Brunette 16th of King's Vale	Mature	14113	5.10.27	273	16	7,511	4·44	333·46	350	326
				Ruby Rose of Tarnpirr ..	Mature	12861	18.10.27	273	21½	8,300	5·14	426·82	350	436, 418, 491, 397
				Brunette 19th of King's Vale	Jr. 3 yrs.	18596	3.11.27	273	..	6,086	5·23	318·25	250	234
				Rosella 12th of King's Vale ..	Jr. 3 yrs.	18604	3.11.27	273	..	5,745	5·45	313·28	250	251
W. H. Atherton, Murraydale	7	5	Jersey ..	Quality of Beverley ..	Mature	13321	3.10.27	273	7	5,661	5·69	322·29	350	276, 337, 378
				Quality's Rosella of Beverley	Jr. 2 yrs.	21095	14.10.27	273	9	4,947	5·27	260·74	200	
				Tiny of Beverley	Mature	13323	6.11.27	240	4	4,905	5·18	254·04	350	231, 427, 317, 453
				Empress of Beverley ..	Jr. 3 yrs.	18607	14.11.27	273	20½	6,082	5·10	309·98	250	372
				Mythic of Beverley ..	Jr. 3 yrs.	18608	6.12.27	273	19	6,330	5·70	361·06	250	330
				Tiny of Meadowvale ..	Mature	9409	6.12.27	273	15	7,041	5·38	378·86	350	374, 361, 298, 461, 486, 468
				Marmione	Jr. 4 yrs.	21094	18·12.27	273	17	6,755	4·70	317·52	300	407

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
W. K. Atkinson, Swan Hill	17	13	Milking Shorthorn	Duchess 7th of Willow Park	Jr. 2 yrs.	..	28.9.27	273	17½	6,473	4·04	261·50	200	
				Blush 2nd of Willow Park	Sr. 2 yrs.	..	1.10.27	273	24½	8,774	3·78	331·86	225	
				Damsel of Willow Park	Mature	13408	6.10.27	273	..	11,096	3·96	439·18	350	338, 409, 452, 380
				Princess 5th of Willow Park	Jr. 3 yrs.	..	8.10.27	273	15½	8,474	3·98	337·52	250	293
				Pearl 2nd of Willow Park	Jr. 2 yrs.	..	17.10.27	273	14½	6,097	3·72	226·74	200	
				Queenie 10th of Willow Park	Jr. 3 yrs.	..	19.10.27	273	12½	7,388	3.73	275·60	250	259
				Peggy of Willow Park	Jr. 4 yrs.	14336	24.10.27	240	9	6,165	3·87	238·65	300	276, 244
				Duchess 3rd of Willow Park	Mature	13489	25.10.27	273	9½	7,499	3·53	265·00	350	277, 180
				Duchess 8th of Willow Park	Jr. 2 yrs.	..	30.10.27	273	..	5,342	4·44	237·21	200	
				Countess 2nd of Willow Park	Jr. 4 yrs.	..	2.11.27	273	..	6,614	4·54	300·39	300	257
				Queenie 6th of Willow Park	Jr. 4 yrs.	..	10.11.27	273	..	6,839	4·16	284·30	300	280
				Countess of Willow Park	Mature	..	27.11.27	273	17½	8,622	4·15	358·21	350	264, 330, 382, 359, 342, 383, 406
				Dainty of Willow Park	Mature	..	30.11.27	273	..	6,927	4·15	287·37	350	240, 283, 285, 296
				Camelia of Willow Park	Jr. 4 yrs.	13206	2.12.27	273	..	12,464	4·13	515·21	300	384, 441
				Princess of Willow Park	Mature	12510	9.12.27	273	30	10,694	3·71	396·75	350	256, 368, 370, 346, 407, 410
				Dainty 2nd of Willow Park	Jr. 2 yrs.	..	19.12.27	273	21	6,575	3·93	258·29	200	
				Dulcie 2nd of Willow Park	Jr. 2 yrs.	..	27.12.27	273	21½	8,514	3·75	319·55	200	
F. Austin, Lara	2	1	Jersey	Avalon Mercedes Duchess 2nd	Jr. 2 yrs.	Vol. 15	14.11.27	273	19	5,082	5·22	265·25	200	
				Mercedes Buttercup 5th of Avalon	Jr. 3 yrs.	18614	2.12.27	273	8	5,412	4·61	249·57	250	237
Aveley Stud Farm Pty. Ltd., Whittlesea	4	4	Jersey	Grevillea of Springhurst	Mature	9655	5.10.27	273	19	8,202	5·47	448·29	350	399, 433, 420, 401, 454
				Aveley Silvermine	Jr. 2 yrs.	Vol. 15	5.10.27	273	19	6,251	5·54	346·00	200	
				Silvermine 21st of Banyule	Mature	9504	10.10.27	273	13½	7,374	5·24	386·35	350	285, 478, 398, 437
				Tragedienne of Aveley	Jr. 3 yrs.	18801	25.11.27	273	12	5,612	4·79	268·82	250	
W. A. Axford, Camperdown	5	3	Jersey	Blossom 5th of Melrose	Mature	11774	7.10.27	273	10½	5,558	5·19	288·64	350	251, 370, 360
				Patricia of Warenda	Mature	11225	7.10.27	273	29½	9,878	5·65	557·72	350	486, 537, 499, 497, 482
				Patricia of Leura	Jr. 3 yrs.	18625	15.10.27	273	23	8,549	4·77	407·96	250	336
				Handsome Girl 9th of Melrose	Mature	9882	22.10.27	273	9	5,834	5·35	312·35	350	326, 324, 343, 408
				Beauty of Leura	Sr. 2 yrs.	18619	26.10.27	273	17	8,249	4·80	395·68	225	

Standard Herd Test—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
A. Balsillie, Bendigo	1	..	Jersey ..	Preston May Blossom ..	Mature	15661	1.11.27	240	17	5,835	4·44	259·15	350	282
Mrs. I. Beard, Outtrim	1	1	Jersey ..	Banksia 2nd of Linga Longa ..	Jr. 2 yrs.	C.R.	23.10.27	210	13½	4,335	6·19	268·50	200	
Mrs. A. J. Black, Noorat	1	1	Jersey ..	Noorat Minion	Sr. 2 yrs.	Vol. 15	20.12.27	273	14½	5,684	5·70	323·96	225	
I. S. Black, Noorat	1	..	Ayrshire	Hygeia of Sparrovale ..	Mature	7311	13.10.27	273	16	7,116	4·11	292·24	350	274, 351, 367, 393
A. A. Broad, Sutton Grange	6	6	Jersey ..	Rosa of Grangelea	Sr. 3 yrs.	18650	1.10.27	273	22½	8,423	5.00	421.30	275	352
				Goldfinch 2nd of Grangelea ..	Mature	14129	8.10.27	273	18½	8,362	5·39	450·98	350	266, 396, 438
				Grangelea Primrose ..	Jr. 2 yrs.	Vol. 15	14.10.27	273	20	7,022	5·27	370·12	200	
				Daisy 2nd of Grangelea ..	Mature	14128	5.11.27	273	19½	8,027	5·70	457·33	350	294, 393, 390, 458
				Princess 4th of Grangelea ..	Mature	15455	6.11.27	273	23	7,776	5·59	434·71	350	312, 429, 454
				Princess 3rd of Grangelea ..	Mature	14130	22.12.27	273	24½	9,078	5·41	491·07	350	295, 378, 458, 408
Mrs. McKay Burnett, Traralgon	1	1	Ayrshire	Gowrie Park Lillias.. ..	Jr. 2 yrs.	16261	15.10.27	273	10	5,168	4·22	218·06	200	
D. Cameron and Sons, Valencia Creek	2	1	Jersey ..	Eminent's Minnehaha 7th of Clarendon Eyre	Jr. 3 yrs.	21268	5.10.27	273	21	6,620	4·57	302·34	250	
				Studleigh Duchess	Jr. 3 yrs.	18653	15.12.27	210	8	4,170	4·99	208·01	250	249, 295
J. Charlton, Stony Creek	1	..	Jersey ..	Lumeah Thelma	Jr. 2 yrs.	C.R.	1.10.27	210	6	3,285	5·03	165·32	200	

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
R. C. Clymo, Bamawn	1	1	Ayrshire	Bertha of Winslade.. ..	Mature	6979	26.12.27	273	28½	12,020	4·28	552·74	350	379, 357, 319
J. Clyne, Upper Maffra West	2	1	Jersey ..	Cora of Paisley	Jr. 3 yrs.	17720	28.10.27	273	18	7,392	5·43	401·11	250	302
				Flossie of Swansea ..	Jr. 2 yrs.	21189	8.11.27	273	12	4,043	4·95	199·93	200	
W. and J. Cockbill, Rockbank	10	6	Ayrshire	Fulham Veronica	Jr. 2 yrs.	14648	28.9.27	273	5½	3,527	4·47	157·77	200	
				Good Luck of Glenord ..	Mature	6253	17.10.27	273	5½	7,018	4·08	286·34	350	368, 338, 341
				Fulham Connie	Jr. 2 yrs.	14639	18.10.27	273	14½	5,241	4·39	229·88	200	
				Fulham Goodluck 2nd ..	Jr. 2 yrs.	14642	23.10.27	273	5	4,755	4·33	205·75	200	
				Fulham Valetta	Mature	10919	24.10.27	273	15½	7,785	4·43	344·73	350	344
				Fulham Gaiety	Jr. 4 yrs.	13334	27.10.27	273	13½	7,142	3·94	281·67	300	312
				Fulham Vanity	Mature	10920	28.10.27	273	13½	7,647	4·74	362·22	350	315, 426
				Cora of Burnside	Mature	8894	16.11.27	273	19½	10,073	4·64	467·74	350	182, 125, 347, 373, 359
				Fulham Lorna	Jr. 2 yrs.	14644	17.11.27	273	11	4,773	4·46	212·94	200	
				Fulham Fashion	Mature	8900	27·11·27	273	25	12,528	4·19	524·87	350	352, 377, 413
D. E. Cook, Loch	2	1	Jersey ..	Fairy Queen of Blackwood Valley	Jr. 4 yrs.	17418	3.10.27	273	5½	4,817	6·20	298·80	300	251, 312
				Modesty of Wattle Vale ..	Jr. 2 yrs.	21203	9.10.27	273	12	6,266	5·52	345·93	200	182
E. E. Davis, Bass	1	1	Jersey ..	Daphney of Blackwood Grove	Jr. 2 yrs.	Vol. 15	21.12.27	273	21½	6,030	4·59	276·99	200	
Department of Agriculture, Burnley Horticultural School	1	..	Jersey ..	Victoria Beauteous ..	Mature	10198	25.10.27	273	9	4,804	6·51	312·51	350	272, 412, 367, 321
	1	1	Friesian	Victoria Wedding Belle ..	Mature	999	22.10.27	273	18	10,457	3·40	355·19	350	239, 311, 337

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
Department of Agriculture, Werribee Research Farm	4	4	Friesian	Victoria Lean Patch ..	Sr. 4 yrs.	1705	4.10.27	273	29	16,452	3·51	577·30	325	326, 306
				Victoria Top Patch ..	Jr. 2 yrs.	2634	4.11.27	*240	17½	5,565	3·63	202·20	200	
				Victoria Carina	Sr. 3 yrs.	2065	13.11.27	273	28	9,774	3·57	349·34	275	335
				Victoria Dominion	Jr. 3 yrs.	Vol. 9	6.12.27	273	25	7,643	3·32	253·98	250	
Department of Agriculture, Werribee Research Farm	9	7	Red Poll	Victoria Rose Major ..	Mature	5AA	29.9.27	273	15½	9,677	3·99	385·71	350	216, 325, 330, 366
				Pico	Mature	250A	1.10.27	273	22½	7,988	3·82	304·84	350	279, 383, 387, 331, 339
				Victoria Velbelle	Jr. 4 yrs.	966AA	1.10.27	273	20	7,767	4·37	339·20	300	251
				Victoria War Dove ..	Jr. 2 yrs.	1677A	5.10.27	273	20	6,252	4·51	282·25	200	
				Cutty Sark	Mature	383C	23.10.27	273	18	9,062	3·95	357·95	350	373, 424, 373, 376, 440, 356
				Victoria Tasacca	Jr. 2 yrs.	1672A	31.10.27	273	19	5,852	4·14	242·00	200	
				Victoria Blue Ribbon ..	Sr. 4 yrs.	1149A	25.11.27	273	22	8,172	4·40	359·20	325	248
				Briar	Mature	379C	3.12.27	273	19½	8,100	4·18	338·41	350	405, 334
				Victoria Feather	Sr. 4 yrs.	..	6.12.27	273	26½	9,416	4·25	400·28	325	380
H. Dettman, Kyneton	2	1	Jersey ..	Elimatta Foundation Lass ..	Jr. 2 yrs.	C.R	19.11.27	273	12	3,836	5·12	196·35	200	
				Elimatta Henley	Jr. 2 yrs.	C.R.	22.11.27	273	12	4,433	4·82	213·49	200	
Dickinson Bros., Sebastopol	1	..	Friesian	Ashby Pauline 5th	Jr. 4 yrs.	1540	18.11.27	273	21½	7,853	3·35	262·92	300	234
Dookie Agricultural College	4	3	Ayrshire	Dookie Tilly	Jr. 2 yrs.	Vol. 20	7.10.27	273	14½	6,290	3·67	231.01	200	
				Ditto of Melburn Grove ..	Mature	11579	3.11.27	273	5	6,813	3·94	268·22	350	256, 183, 353
				Dookie Poppy	Jr. 2 yrs.	Vol. 20	6.11.27	273	21	7,368	3·78	278·51	200	
				Dookie Clare	Jr. 2 yrs.	Vol. 20	7.11.27	273	16	5,928	4·04	239·76	200	
T. S. Dowson, Hicksborough	2	2	Jersey ..	Warenda Garenne 7th ..	Jr. 2 yrs.	Vol. 15	14.11.27	273	11	4,385	5·82	255·16	200	
				Gazelle 3rd of Warenda ..	Mature	15558	8.12.27	273	15	6,740	5·21	351·19	350	367, 462, 382

* Calved prematurely.

Standard Herd Test—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
P. J. Ducat, Ardmona	2	1	Jersey ..	Handsome Girl of Airlie ..	Sr. 2 yrs.	18696	28.10.27	273	13	4,616	5·35	246·83	225	
				Airlie Beauty 2nd	Jr. 2 yrs.	C.R.	25.11.27	210	4	2,970	4·47	132·74	200	
S. Earle, Merricks	3	..	Jersey	Cymbal of Benguella ..	Mature	16638	26.10.27	273	17	6,394	4·84	309·43	350	232, 266
				Holly of Benguella	Jr. 4 yrs.	17731	30.10.27	210	4	3,420	4·01	137·17	300	229
				Flower of Bignold ..	Mature	11240	1.11.27	210	4	4,005	3·95	158·05	350	206, 301, 337
A. J. Eldridge, Nooral	2	2	Friesian	Burnbank Lady Patch ..	Jr. 2 yrs.	Vol. 9	27.12.27	273	37½	10,503	3·86	405·83	200	
				St. Alban's Cordyline Inka ..	Sr. 3 yrs.	2289	30.11.27	273	16	10,001	3·63	363·07	275	316
A. E. Ellis, Loch	5	4	Jersey ..	Millie of Kelburn	Mature	9270	4.10.27	273	9	7,424	4·29	318·77	350	278, 319
				Bonnie Brae Maid	Jr. 3 yrs.	Vol. 16	28.10.27	273	10½	4,653	6·23	290·04	250	
				Blackwood Grove Nancy ..	Jr. 2 yrs.	Vol. 15	3.11.27	273	13	5,697	5·19	295·02	200	
				Blackwood Grove Beatrice 2nd	Jr. 3 yrs.	Vol. 15	1.12.27	240	4	4,665	5·87	273·97	250	
				Blackwood Grove Mandy ..	Jr. 3 yrs.	Vol. 15	1.12.27	273	10½	6,146	5·17	317·47	200	
A. E. Enders, Stanhope	1	..	Friesian	Burnbank Segis Delhurst ..	Jr. 3 yrs.	2391	4.10.27	240	4	6,720	3·25	218·61	250	
G. Esler, Tongala	3	1	Jersey ..	Jubilee Thyme	Mature	14149	9.10.27	273	6	7,052	5·23	368·74	350	356, 366, 509
				Linda of Tuerong	Mature	10482	30.11.27	273	12	5,799	4·36	253·12	350	219, 217, 269, 341, 302
				Jubilee Lily	Mature	10454	12.12.27	273	10	6,684	5·20	347·90	350	332, 326, 348, 358
A. T. N. Facey, Thomastown	1	..	Ayrshire	Margaret of Olive Dale ..	Jr. 4 yrs.	14044	1.11.27	240	4	6,458	3·95	254·84	300	

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
W. Fluck, Yallock	1	..	Ayrshire	Fleurbaix Empress	Jr. 2 yrs.	16043	15.10.27	273	6	4,089	4·09	167·41	200	
A. Fixter, Boisdale	1	1	Jersey ..	Beauty's Daffodil of Lesterfield	Mature	10265	18.12.27	210	31½	7,590	4·78	362·84	350	304, 208, 364, 422, 528, 523
Flack & Gamble, Dhurringile	1	1	Friesian	Dominion Iona	Mature	263	16.12.27	180*	64	15,576	3·03	471·66	350	336, 225, 361, 382, 693, 647, 749
Foster Bros., Boisdale	1	1	Jersey ..	Brunette 22nd of King's Vale	Jr. 2 yrs.	21084	18.12.27	273	19½	6,060	5.11	309·42	200	
J. L. Gardener, Welshpool	5	1	Jersey ..	Golden Belle of Whare Koa ..	Mature	12957	28.9.27	273	10	6,679	5·17	345·21	350	327
				Lauriston Lady Lotus ..	Jr. 2 yrs.	21296	1.10.27	273	8½	4,309	5·04	217·01	200	
				Lotus Queen of Whare Koa..	Mature	14153	1.10.27	273	10	6,656	4·86	323·51	350	290, 317, 371
				Daisy Belle of Whare Koa ..	Mature	14152	28.10.27	273	10½	6,593	4·73	311·62	350	258, 310, 300
				Brown Belle of Whare Koa ..	Mature	14151	7·12.27	273	15	5,523	5·41	298·80	350	304, 341, 343
O. Gepp, Macleod	1	1	Jersey ..	Bright Light of Wilga ..	Mature	21305	14.11.27	273	20	8,016	4·63	371·26	350	315
Gibson Bros., Trafalgar	8	8	Jersey ..	Leathorne Lilac	Sr. 3 yrs.	Vol. 15	3.10.27	273	16½	5,945	5·34	317·50	275	
				Lynette of Leathorne ..	Jr. 4 yrs.	16276	7.10.27	273	4	5,902	5·23	308·76	300	292, 206
				Old Gold of Glen Iris ..	Sr. 3 yrs.	16681	13.10.27	273	10	4,892	6·26	306·00	275	307
				Lorraine of Leathorne ..	Jr. 4 yrs.	16275	23.10.27	273	12½	6,113	5·27	322·21	300	245
				Sweet Star of Glen Iris ..	Jr. 4 yrs.	14178	30.10.27	273	14½	7,193	5·66	406·89	300	283, 337
				Annie Laurie of Leathorne ..	Mature	16270	1.11.27	273	15½	7,121	5·72	407·36	350	302, 308
				Buttercup of Leathorne ..	Jr. 4 yrs.	16272	1.11.27	273	13	6,323	6·02	380·74	300	279
				Creamy 3rd of Lesterfield ..	Mature	9378	8.12.27	273	28	8,923	5·92	527·80	350	482, 439, 544, 503

* Herd withdrawn before completion of Test.

Standard Herd Test—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
R. H. Gibson, Glengarry	2	2	Friesian	St. Albans' Daffodil's Betty ..	Jr. 2 yrs.	C.R.	27.12.27	273	27	7,415	4·05	300·41	200	
				St. Albans' Omi Mi ..	Jr. 2 yrs.	C.R.	27.12.27	273	26	8,891	3·81	338·69	200	
R. Goodman, Kilmany South	6	1	Ayrshire	Starlight of Roseneath ..	Mature	13516	5.10.27	273	15½	4,697	3·80	178·63	350	249, 218, 181
				Floss of Roseneath ..	Mature	7333	8.10.27	273	11⅔	4,385	3·78	165·87	350	232, 314, 169, 241
				Roseneath Future	Sr. 4 yrs.	16590	21.10.27	273	14	8,694	3·82	332·25	325	170, 225
				Roseneath Gem	Jr. 2 yrs.	16591	23.10.27	273	12	2,546	4·29	109·22	200	
				Roseneath Goldleaf.. ..	Jr. 3 yrs.	14838	23.10.27	240	4	3,780	3·92	148·13	250	120
				Roseneath Fanny	Jr. 2 yrs.	16588	26.10.27	273	18½	4,331	4·27	184·77	200	
A. W. Gorman, Alexandra	3	1	Ayrshire	Heather of Cathcart ..	Jr. 4 yrs.	12142	3.10.27	273	9	8,324	3·61	300·57	300	249, 207
				Favourite of Cathcart ..	Jr. 4 yrs.	12141	8.10.27	273	7	6,602	4·40	290·28	300	254, 270
				Maisie of Cathcart	Mature	11079	26.10.27	273	4	7,844	3·90	306·14	350	254, 283, 270
E. Hall, Tongala	3	..	Jersey ..	The Valley Primrose 3rd ..	Jr. 2 yrs.	Vol. 15	21.10.27	273	7½	3,008	5·15	154·91	..	
				Melwood Corella ..	Jr. 2 yrs.	Vol. 15	25.10.27	273	7	2,963	4·88	144·59	200	
				Queenie of Comely Banks ..	Mature	15497	10.12.27	273	13½	5,123	4·58	234·48	350	254, 301, 345
S. C. Handley, Dandenong	1	1	Jersey ..	Lady Gold of Murta ..	Jr. 3 yrs.	21513	12.11.27	273	24½	9,048	6·07	548·82	250	307
J. E. Handbury and Sons, Toora	2	2	Jersey ..	Lassie of Toora Vale ..	Sr. 2 yrs.	18727	22.10.27	273	11	5,895	5·69	335·70	225	263
				Toora Vale Clover	Jr. 2 yrs.	Vol. 15	17.12.27	273	12	4,646	5·36	249·24	200	
D. Harker, Caldermeade	3	1	Ayrshire	Alba of Thirlmere	Sr. 3 yrs.	12209	1.10.27	273	7	4,764	3·81	181·65	275	205
				Poppy of Thirlmere ..	Mature	12211	1.11.27	273	..	6,966	4·25	296·27	350	223
				Petals of Rankeillor ..	Mature	9218	2.1.28	273	23	8,457	4·76	402·51	350	329

Standard Herd Test—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
G. E. Harker, Caldermeade	1	1	Ayrshire	Ayrgarth Patricia	Jr. 2 yrs.	14902	5.10.27	273	11	5,111	4·17	213·01	200	
W. Harker, Caldermeade	2	..	Ayrshire	Clarice of Wayside	Sr. 2 yrs.	14904	3.10.27	273	9½	4,869	4·17	203·41	225	
				Linda of Wayside	Sr. 2 yrs.	14906	22.10.27	273	13	3,969	4·19	166·49	225	
T. Harvey, Boisdale	4	4	Jersey ..	Bluebell 5th of Jerseyholm ..	Sr. 4 yrs.	13355	8.10.27	273	18	8,396	5·98	502·06	325	357, 606
				Empress of Jerseyholm ..	Mature	9393	28.10.27	273	21½	9,962	5·01	499·55	350	400, 524, 527, 596, 508, 567
				Empress 4th of Jerseyholm ..	Mature	13356	16.11.27	273	17½	7,298	5·27	384·52	350	383
				Kirsty 16th of Jerseyholm ..	Jr. 3 yrs.	18736	18.11.27	273	18½	7,661	5·65	432·73	250	351
W. Henderson, Grasmere (Home Farm)	8	8	Ayrshire	Iris 4th of Carracoorte ..	Mature	9386	30.9.27	273	11½	9,260	4·57	423·39	350	251, 275, 265, 355
				Iris 6th of Carracoorte ..	Jr. 3 yrs.	15858	30.9.27	273	15	5,640	4·61	260·06	250	
				Bunty 3rd of Carracoorte ..	Mature	9330	3.10.27	273	12	8,796	4·57	401·73	350	208, 341, 389, 195, 312
				Iris 5th of Carracoorte ..	Mature	9387	6.10.27	273	18	9,237	4·26	393·87	350	341, 250, 346
				Brownie 13th of Carracoorte	Jr. 2 yrs.	15855	1.11.27	273	7	4,539	4·48	203·45	200	
				Sparrovale Fairy	Jr. 2 yrs.	16657	9.11.27	273	28½	7,736	3·97	306·81	200	
				Blanche of Carracoorte ..	Mature	9323	22.11.27	273	20	8,375	4·46	373·65	350	271, 289, 252, 362
				Lucy 7th of Carracoorte ..	Jr. 4 yrs.	13626	24.11.27	273	30½	9,911	4·51	446·81	300	185
E. H. Howlett, Morwell	1	..	Jersey ..	Lotus 2nd of Banyule ..	Mature	11588	7.11.27	273	15	5,648	5·95	336·29	350	279
A. Hubbard, Yarra Glen	8	5	Ayrshire	Purity of Emoh Ruo ..	Sr. 3 yrs.	12261	29.9.27	273	19½	6,869	4·83	331·76	275	
				Modesty of Emoh Ruo ..	Sr. 3 yrs.	12260	30.9.27	240	4	5,130	4·39	225·40	275	
				Daphne of Emoh Ruo ..	Jr. 4 yrs.	12259	30.9.27	273	13½	6,401	4·74	303·24	300	
				Sparkle of Fern Hill ..	Mature	11419	20.10.27	210	4	4,890	4·08	199·50	350	
				Miss Prim of Emoh Ruo ..	Jr. 3 yrs.	13678	21.11.27	273	6½	6,551	4·10	268·43	250	
				Melba of Glenholme ..	Mature	11091	10.12.27	273	20	7,714	4·98	384·11	350	
				Alvie of Sunnyside	Mature	12942	16.12.27	273	27½	8,034	4·57	367·00	350	
				Bernie's Molly of Sunnyside ..	Mature	10620	18.12.27	273	15½	6,872	4·35	298·93	350	

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
J. A. Huffer, Gormandale	5	5	Jersey ..	Rosebud of Glen Valley ..	Sr. 2 yrs.	18755	10.10.27	273	15	8,033	4·49	360·46	225	269
				Rosebud's Perrees Fancy of Glen Valley	Jr. 2 yrs.	21357	11.10.27	273	11½	6,347	4·84	307·48	200	
				Czarina of Glen Valley ..	Sr. 3 yrs.	18754	26.10.27	273	12½	7,181	5·55	398·73	275	331
				Waverley Lass of Glen Valley	Jr. 2 yrs.	21361	30.10.27	273	12	5,993	4·84	290·34	200	
				Glen Valley Quick Sand ..	Jr. 2 yrs.	Vol. 15	28.12.27	273	19	5,907	5·61	331·32	200	
W. H. Hurrey, Koonwarra	4	4	Jersey ..	Kooreena Lulu	Jr. 2 yrs.	Vol. 15	4.10.27	273	12	5,210	5·48	285·61	200	
				Kyora Pearl 2nd	Jr. 3 yrs.	21366	31.10.27	240*	14	5,310	4·79	254·61	250	242
				Cream Belle 6th of Gnarbrook	Sr. 3 yrs.	17443	1.12.27	273	22	7,259	4·55	330·03	275	280, 312
				Lulu 5th of Roelands ..	Jr. 4 yrs.	17438	16.12.27	273	18	6,924	4·65	322·03	300	268, 377
A. Joshua, Berwick	3	2	Jersey ..	Goldfinch of Cloverfield ..	Jr. 4 yrs.	16293	5.10.27	273	11½	5,465	5·96	325·84	300	212, 204
				Mistletoe 3rd of Tarnpirr ..	Mature	9443	24.10.27	273	13	6,371	5·58	355·25	350	284, 254, 288, 324, 336
				Songstress of Kameruka ...	Mature	13212	30.11.27	273	6½	6,581	4·61	303·13	350	
R. B. Kelly, Tatura	2	2	Jersey ..	Lady Fowler of Rosemont ..	Jr. 4 yrs.	16720	4.10.27	273	14½	6,909	5·00	345·75	300	256, 237, 308
				Ettie 9th of Banyule ..	Jr. 2 yrs.	18804	9.12.27	210†	20½	4,890	5·27	257·93	200	
G. A. Kent, Archie's Creek	5	1	Ayrshire	Peggy of Woolamai Park ..	Mature	5275	19.10.27	273	11	7,790	4·21	328·11	350	224, 244, 267, 325, 307, 326, 307
				Pearl of Woolamai Park ..	Sr. 2 yrs.	13753	15.11.27	273	13	6,821	4·36	297·62	225	226
				Mermaid 3rd of Woolamai Park	Jr. 3 yrs.	13748	23.11.27	273	4	4,287	4·72	202·20	250	230
				Bud of Woolamai Park ..	Mature	7434	6.12.27	210	4	6,015	4·24	255·14	350	211, 234, 299, 299, 280
				Dulcie of Woolamai Park ..	Jr. 4 yrs.	12355	20.12.27	240	4	5,138	4·09	210·12	300	248, 257

* Calved prematurely.
† Sold before completion of term.

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
H. W. King, Gormandale	2	2	Jersey ..	Honey Bee of Roschill ..	Sr. 4 yrs.	14847	3.10.27	273	14	7,328	5·19	380·64	325	378
				Twilight of Glen Valley ..	Jr. 3 yrs.	21390	26.10.27	273	7½	6,087	4·68	285·16	250	264
T. Knowles, Dandenong	6	5	Ayrshire	Dandy Cream Princess ..	Jr. 2 yrs.	15028	28.9.27	273	7½	5,283	3·95	208·59	200	
				Fern Hill Betty	Jr. 3 yrs.	15539	8.10.27	273	13½	7,061	4·25	300·19	250	
				Palm of Gleneira	Mature	7098	16.10.27	210	4	5,558	3·72	206·82	350	258
				Fanny of Rosstrevor ..	Jr. 3 yrs.	13349	18.10.27	273	21	8,179	3·63	296·52	250	263
				Dandy Nanette	Jr. 2 yrs.	15029	7.11.27	273	14	5,142	4·50	231·32	200	
				Plum of Invergorden ..	Jr. 3 yrs.	13235	1.12.27	273	10	6,407	4·04	258·69	250	261
Mrs. E. M. Lennie, Tongala	4	3	Jersey ..	Music of the Valley	Jr. 4 yrs.	17450	8.10.27	273	9	6,905	4·71	325·26	300	259, 347
				Linda 4th of the Valley ..	Jr. 4 yrs.	17776	13.10.27	273	13	5,795	4·84	280·60	300	277, 313
				Rye Gold Princess 2nd of Glen Iris	Sr. 2 yrs.	18785	28.10.27	273	12	5,403	5·21	281·55	225	
				The Valley Dahlia 2nd ..	Jr. 2 yrs.	Vol. 15	12.11.27	273	11½	4,571	5·44	248·44	200	
Leongatha High School, Leongatha	2	1	Jersey ..	Moana of Woorayl	Jr. 3 yrs.	17673	1.11.27	240	4	3,630	5·60	203·27	250	238
				Ceilia of Woorayl	Mature	9560	18.12.27	273	18	7,992	5·54	442·39	350	278, 388, 438, 474, 471, 512, 409
Longerenong Agricultural College, Dooen	8	..	Ayrshire	Merle of Longerenong ..	Jr. 4 yrs.	12435	1.10.27	273	6	6,416	4·19	269·13	300	283, 314
				Star of Longerenong ..	Sr. 4 yrs.	13825	7.10.27	273	4	4,409	4·22	186·04	325	187, 123
				Longerenong Glory ..	Jr. 2 yrs.	16431	8.10.27	273	11½	3,573	4·69	167·64	200	
				Longerenong Venus ..	Jr. 2 yrs.	16435	13.10.27	273	14	4,605	4·02	185·06	200	
				Mercy of Oakbank ..	Mature	5350	18.10.27	273	4	6,411	3·77	241·85	350	297, 303, 327, 259
				Longerenong Stella ..	Jr. 2 yrs.	16434	24.10.27	273	12½	3,625	4·79	173·59	200	
				Dolichos of Longerenong ..	Mature	9789	29.10.27	240	4	7,088	3·97	281·70	350	244, 324, 253, 287
				Starette of Fern Hill ..	Mature	5949	18·11·27	273	10	6,738	3·75	252·76	350	256, 281, 348, 265

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
Mrs. L. Lowing, Tongala	5	5	Jersey ..	Patricia of Jersey Vale ..	Jr. 3 yrs.	18886	9.10.27	273	11	5,351	5·51	294·93	250	217
				Nellie of Jersey Vale ..	Sr. 2 yrs.	21543	10.10.27	273	10	4,763	5·08	242·19	225	226
				The Valley Star	Jr. 2 yrs.	Vol. 15	28.10.27	273	15	5,007	4·55	227·76	200	
				Sweet Lily of the Valley ..	Sr. 2 yrs.	21426	6.11.27	273	17	4,686	4·87	228·01	225	228
				Jersey Vale Canary ..	Jr. 2 yrs.	Vol. 15	9.11.27	273	14	4,427	6·06	268·41	200	
C. G. Lyon, Heidelberg	5	5	Jersey ..	Silver May of Banyule ..	Jr. 3 yrs.	16693	14.10.27	273	17½	7,487	5·03	376·56	250	
				Tiddlewinks 2nd of Banyule ..	Jr. 2 yrs.	18822	3.11.27	273	15½	6,305	5·43	342·31	200	
				Velveteen 9th of Banyule ..	Jr. 3 yrs.	16696	6.11.27	273	21½	8,900	5·50	489·75	250	314
				Molly 21st of Banyule ..	Jr. 2 yrs.	18808	15.11.27	273	16½	6,489	5·39	349·83	200	
				Princess 2nd of Banyule ..	Jr. 4 yrs.	14194	25.11.27	273	..	8,666	5·51	477·68	300	406, 411
C. W. W. Macauley, Rochester	3	3	Jersey ..	Christmas Chimes of Taranah	Sr. 2 yrs.	18848	29.9.27	273	19½	7,199	5·66	407·13	225	317
				Taranah Roseleaf	Sr. 3 yrs.	Vol. 15	17.11.27	273	15½	5,867	6·08	356·73	275	292
				Taranah Daisy	Jr. 2 yrs.	Vol. 15	21.11.27	273	13½	4,317	4·72	203·95	200	
Miss C. E. McClelland, Tunstall	1	1	Jersey ..	Poppy of the Elms ..	Jr. 3 yrs.	21447	17.11.27	273	21	7,289	5·21	380·12	250	266
J. McDougall, Byaduk	3	2	Jersey ..	Novelty of Parkview ..	Jr. 4 yrs.	17791	20.10.27	273	21	8,211	5·10	418·92	300	374, 398
				Jessie of Parkview ..	Sr. 3 yrs.	18827	14.11.27	273	23½	7,661	4·79	366·99	275	314
				Florence of Kelburn ..	Mature	13374	1.12.27	273	15	7,065	4·49	317·46	350	335, 336
H. V. MacLeod, Tyrendarra	3	2	Jersey ..	Princess of Castlemaddie ..	Sr. 2 yrs.	21484	10.10.27	273	16	6,396	5·25	336·04	225	349
				Duchess of Castlemaddie ..	Jr. 2 yrs.	21480	27.10.27	273	19½	6,484	4·79	310·53	200	
				Sweet Bell of Rochdale ..	Mature	9794	10.11.27	240	4	5,190	5·39	279·95	350	379, 379

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
Mesdames McWhae and Silvester, Merino	7	7	Guernsey	Woolongbar Leonie 6th ..	Jr. 2 yrs.	..	7.11.27	273	20½	5,882	4·97	292·24	200	
				Woolongbar Parsons Red Rose 44th	Jr. 2 yrs.	..	13.11.27	273	12	5,229	5·68	297·09	200	
				Knightlea Favourite ..	Jr. 2 yrs.	..	30.11.27	273	19	5,726	5·02	287·54	200	
				Spurfield Luxury	Jr. 2 yrs.	..	30.11.27	273	17	5,211	4·62	240·98	200	
				Spurfield Gloria	Jr. 2 yrs.	..	8.12.27	273	13½	5,847	4·55	265·76	200	
				Minnamurra Elizabeth ..	Jr. 2 yrs.	..	19.12.27	273	4	5,522	5·00	276·33	200	
				Minnamurra Orama ..	Jr. 3 yrs.	490	21.12.27	273	27	8,940	4·94	442·07	250	
R. H. Maher, Tongala	2	2	Jersey ..	Rosemont Jessie 3rd ..	Jr. 2 yrs.	Vol. 15	24.10.27	273	11½	4,694	5·58	261·79	200	
				Laura 12th of Melrose ..	Mature	9894	2.11.27	273	13½	7,602	5·85	444·75	350	389, 363, 390, 456, 455, 467
P. J. Maloney, Tongala	3	3	Jersey ..	Tiny Choice of Belgonia ..	Mature	11634	2.11.27	273	23	10,256	5·73	587·65	350	384, 340, 625
				Milklass of Belgonia ..	Jr. 4 yrs.	21491	30.11.27	273	18	10,344	5·53	571·67	300	432
				Peggy of Belgonia	Jr. 4 yrs.	17799	28.12.27	273	27	10,974	5·19	569·89	300	420, 525
A. J. Mapleson, Jindivick	5	5	Jersey ..	Moonlight of Hazeldale ..	Jr. 3 yrs.	21499	5.10.27	273	13	5,436	4·86	264·41	250	231
				Jessie's Pride of Hazeldale ..	Sr. 2 yrs.	21496	8.10.27	273	15	6,759	6·19	418·20	225	290
				Jessie of Meridale	Mature	9552	21.10.27	273	15	8,427	5·55	468·02	350	513
				Chevy of Hazeldale.. ..	Sr. 3 yrs.	17468	24.10.27	257	13½	5,765	5·00	288·10	275	
				Eileen 2nd of Clarendon Eyre	Mature	13521	20.11.27	240*	21	7,410	5·45	403·69	350	468
R. Masters, Swan Hill	1	1	Ayrshire	Roma of Sunnyside ..	Mature	8062	2.10.27	273	..	9,088	4·07	369·60	350	
T. Mesley, Dalyston	5	5	Jersey ..	Buttercup of Murta ..	Sr. 2 yrs.	21511	28.9.27	180†	27	6,030	5·14	309·87	225	299
				Mandolin 2nd of Warenda ..	Jr. 3 yrs.	21515	30.9.27	273	24	8,277	4·96	410·23	250	
				Meadow Queen of Warenda ..	Jr. 4 yrs.	17805	20.10.27	273	12½	6,533	5·25	342·97	300	322, 313
				Charmian 3rd of Warenda ..	Jr. 4 yrs.	17802	22.10.27	273	19	7,212	6·14	442·58	300	345, 350
				Garenne 5th of Warenda ..	Mature	15557	26.10.27	273	16½	6,395	6·17	394·27	350	385, 437, 346

* Calved prematurely. † Sold before completion of term.

Standard Herd Test—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
W. H. Oniey, Caldermeade	1	..	Ayrshire	Ladyship of Gleneira ..	Mature	8444	1.10.27	273	10½	6,092	3·58	217·94	350	
W. Parbury, Warburton	1	..	Jersey	Rosalind 6th of Brookfield ..	Mature	21561	1.11.27	273	9	5,366	5·43	291·25	350	310, 316
J. Phillips, Murraydale	2	2	Jersey ..	Vanilla 18th of Melrose ..	Mature	13424	30.9.27	273	14½	6,959	5·47	380·62	350	328, 401, 428, 390
				Carnation of Peri	Sr. 3 yrs.	17818	5.10.27	240	4	6,390	4·61	294·53	275	221, 280
Pinkerton Bros., Kongwak	4	2	Ayrshire	Dalblair Lottie	Jr. 2 yrs.	15918	1.10.27	273	4	4,142	3·62	150·04	200	
				Dalblair Posy	Jr. 2 yrs.	15922	4.10.27	240	4	4,815	3·39	163·32	200	
				Abbeville Irene	Jr. 2 yrs.	15649	13.11.27	273	..	6,176	3·73	230·25	200	
				Abbeville Tulip	Jr. 2 yrs.	15652	1.12.27	273	18	6,219	4·24	263·84	200	
J. Plattfuss, Tongala	7	3	Friesian	Burnbank Spring Patch ..	Jr. 4 yrs.	1819	9.10.27	273	17½	9,362	3·25	304·26	300	312, 252
				Yorkshire Oakwood Topsy ..	Mature	1726	12.10.27	273	4	7,875	3·27	257·35	350	295, 296
				Greenvale Mona 2nd ..	Jr. 3 yrs.	Vol. 7	27.10.27	273	16	7,110	3·27	232·84	250	237
				Greenvale Ideal Paxton ..	Sr. 2 yrs.	2198	8.11.27	273	24	8,261	3·00	247·79	225	325
				Daffodil of Greenvale ..	Mature	Vol. 3	16.11.27	273	22	9,086	3·57	324·86	350	239, 340, 400
				Yorkshire Oakwood Togo ..	Jr. 3 yrs.	2336	20.11.27	273	27½	7,760	2·88	221·44	250	298
				Monavale Juno Paxton ..	Mature	169	2.12.27	273	..	13,515	3·14	424·12	350	326, 388, 545, 595
D. and M. A. Poole, Caldermeade	1	..	Ayrshire	Foliage of Golden Vein ..	Mature	5423	19.11.27	273	5	4,640	3·77	174·98	350	278, 251, 263
R. Poyner, Lilydale	2	2	Jersey	Cream Bell of Kirkhill ..	Jr. 2 yrs.	21519	28.9.27	273	..	4,763	5·67	270·06	200	
				Kyora Fochs Anthem 2nd ..	Jr. 2 yrs.	Vol. 15	7.10.27	273	..	5,708	4·99	285·06	200	

Standard Herd Test—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
R. Purnell, Moriac	3	3	Jersey	Lady Grey 18th of St. Albans	Mature	11515	18.10.27	273	20	8,465	5·16	437·14	350	255, 347, 376, 360, 374
				St. Albans Lady Grey 31st ..	Sr. 4 yrs.	Vol. 15	23.10.27	273	23	7,280	5·53	402·47	325	292, 330, 338
				Narrawong Laurie	Jr. 2 yrs.	Vol. 15	15.11.27	273	14½	5,370	5·28	283·50	200	
Quigley and Bennett, Yinnar	2	2	Jersey ..	Ellendale Bluebell 2nd ..	Jr. 2 yrs.	Vol. 15	26.10.27	240	4	5,025	4·88	245·26	200	
				Bluebell of Ellendale ..	Sr. 3 yrs.	18922	18.12.27	240	18½	5,760	5·51	317·25	275	308
Miss H. E. Raleigh, Pakenham Upper	1	1	Jersey ..	Trumpet Daffodil of Goronga Farm	Jr. 3 yrs.	21597	27.12.27	273	15½	5,610	6·15	344·98	250	269
D. Ralston, Euroa	4	3	Ayrshire	Pledge of Ben Kell ..	Mature	11350	29.9.27	273	20½	8,598	5·28	453·91	350	274, 436
				Ben Kell Winette	Jr. 2 yrs.	15422	6.10.27	273	18	5,451	4·40	239·92	200	
				Wanda of Ben Kell.. ..	Mature	11352	6.10.27	240	4	7,575	4·18	316·87	350	227, 315, 350
				Bloomer of Ben Kell ..	Jr. 2 yrs.	15416	8.10.27	273	16½	4,850	4·42	214·20	200	
W. Regnier, Poowong	2	1	Friesian	Henley Countess	Jr. 4 yrs.	1880	8.10.27	273	9	12,527	3·06	383·12	300	
				Baromi Belle	Mature	Vol. 5	15.10.27	273	14½	7,935	4·13	327·47	350	314
W. S. Richardson Riddell	4	3	Jersey ..	Butter Queen 3rd of St. Albans	Jr. 3 yrs.	21371	28.9.27	273	15½	6,325	5·28	334·12	250	289
				Sutton Lea Jenny	Jr. 2 yrs.	Vol. 15	23.10.27	273	11	3,933	6·04	237·49	200	
				Kyora Starbright	Sr. 4 yrs.	16308	27.10.27	273	12	6,418	5·19	333·20	325	164, 328, 371
				Golden Parcil 2nd of Boorene	Mature	11227	31.10.27	273	11	4,986	5·92	295·00	350	295, 376, 320

Standard Herd Test—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
Miss S. L. Robinson, East Kew	5	1	Jersey ..	Kyora Foch's May	Sr. 2 yrs.	18946	11.10.27	273	18	5,080	5·72	290·70	225	
				Countess Matilda 4th ..	Mature	13869	14.10.27	273	19½	6,844	4·93	337·17	350	376, 409
				Kyora Duke's Needle ..	Mature	16342	14.10.27	273	6⅛	3,355	5·28	177·27	350	
				Silk of Woodside	Mature	11260	28.11.27	240	4	5,095	5·19	264·21	350	357
				Kyora Starbright 2nd ..	Sr. 3 yrs.	18947	29.11.27	240	4	4,095	5·96	244·15	275	246
G. Rowe, Kardella	7	3	Jersey ..	Sparklight's Pansy of Welbourne	Jr. 4 yrs.	21637	30.9.27	273	15	5,563	5·71	317·64	300	263
				Handsome Pansy of Welbourne	Jr. 4 yrs.	17829	5.10.27	273	15	7,389	4·40	325·20	300	262, 326
				Pretty Pansy of Welbourne ..	Mature	13386	15.10.27	273	9½	5,312	5·14	273·22	350	220, 286, 264, 247
				Sweet Pansy's Poppy of Welbourne	Mature	13387	18.11.27	273	11½	6,431	4·84	311·38	350	180, 268, 306
				Trixie of Welbourne ..	Jr. 3 yrs.	21638	8.12.27	273	9½	3,893	5·48	213·32	250	221
				Joy of Hill Crest	Mature	10468	20.12.27	273	5	4,922	4·84	238·26	350	205, 222, 207, 264 246, 252
				Pansy Leaf of Welbourne ..	Sr. 2 yrs.	21636	22.12.27	273	12	3,971	5·99	237·68	225	203
C. N. Runciman, Murraydale	2	..	Jersey ..	Sapphire 2nd of Lea Hurst ..	Jr. 2 yrs.	21226	2.10.27	273	..	2,793	5·12	143·14	200	168
				Canary 7th of Goulburn ..	Jr. 3 yrs.	19870	28.11.27	273	..	3,617	6·41	231·92	250	246
W. A. Sandles, Mount Best	3	2	Jersey ..	Lady Betsy's Tottie of Franklin Park	Sr. 2 yrs.	18959	6.10.27	273	16	5,335	4·71	251·41	225	
				Sylvia of Franklin Park ..	Sr. 4 yrs.	14262	31.10.27	273	9½	5,310	5·14	272·88	325	252, 285
				Rose's Princess of Franklin Park	Sr. 2 yrs.	18961	17.11.27	273	8½	4,428	5·11	226·23	225	174
Salesian College, Sunbury	3	1	Ayrshire	Daisy of Rupertswood ..	Jr. 4 yrs.	12596	11.11.27	180	4	4,515	4·14	187·08	300	299, 243
				Linda of Medburn Grove ..	Mature	8303	6.12.27	273	22	9,825	3·58	351·48	350	284, 355, 394, 406, 318, 209
				Grace of Roseleigh	Mature	7301	11.12.27	273	5	6,627	3·83	254·10	350	297, 255, 231, 172

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
A. H. Schier, Kernot	13	3	Ayrshire	Scotswood Virtue	Jr. 2 yrs.	16631	28.9.27	273	5	4,238	4·11	174·26	200	
				Scotswood Mitre	Jr. 4 yrs.	16623	6.10.27	273	12	6,406	3·97	254.31	300	323, 278
				Scotswood Mabs	Mature	11367	15.10.27	273	6	5,259	4·20	220·96	350	234, 244
				Scotswood Silkie	Jr. 2 yrs.	16629	18.10.27	273	7	4,602	4·51	207·57	200	
				Scotswood Marionette ..	Jr. 2 yrs.	16618	24.10.27	120	4	1,275	4·53	57·71	200	
				Scotswood Silverine ..	Sr. 2 yrs.	15497	24.10.27	273	4	4,071	4·00	162·99	225	134
				Scotswood Idalia	Sr. 2 yrs.	15478	3.11.27	210*	20	5,715	4·04	230·84	225	217
				Scotswood Margot	Jr. 4 yrs.	14150	7.11.27	273	7	4,481	4·25	190·52	300	240
				Scotswood Jeanette ..	Mature	10298	14.11.27	240	4	5,670	3·66	207·66	350	229, 264, 322, 244
				Scotswood Madge	Jr. 2 yrs.	16613	20.11.27	273	5½	3,834	4·42	169·58	200	
				Scotswood Fragrance ..	Jr. 2 yrs.	16609	2.12.27	273	14½	4,913	4·23	207·69	200	
				Scotswood Muriel	Sr. 2 yrs.	15496	12.12.27	273	10	3,851	4·28	164·76	225	
				Scotswood Myra	Mature	14158	20.12.27	273	9½	4,569	3·76	171·91	350	196, 263, 237
H. A. Schier, Rochester	3	3	Jersey ..	Princess 5th of Grangelea ..	Jr. 4 yrs.	18448	6.11.27	273	23½	8,357	5·13	428·01	300	413
				Fairhope Primrose ..	Sr. 2 yrs.	21400	1.12.27	273	13	6,301	5·22	328·61	225	
				Jenny Lind 2nd of Taff Vale..	Jr. 4 yrs.	17831	2.12.27	273	15½	6,800	5·13	348·67	300	352
C. H. Sell, Irrewillipe	1	..	Jersey ..	Canary 4th of Lesterfield ..	Mature	10267	10.12.27	273	13½	5,398	5·54	299·13	350	274, 383, 388, 391
Simpson and Son, Lower Ferntree Gully	2	2	Jersey ..	Wompini Flower	Jr. 2 yrs.	21665	8.10.27	273	15	5,453	5·39	294·10	200	
				Harmony of Hill Crest ..	Mature	13745	12.11.27	273	23	8,624	5·09	438·58	350	355, 375
G. and W. Smith, Fish Creek	1	1	Jersey ..	Miss Maitland of Elouera ..	Mature	13395	9.10.27	273	15½	7,722	5·12	395·30	350	
F. P. Stephens, Tongala	1	1	Jersey ..	Ipomea of Swansea ..	Jr. 3 yrs.	21248	10.11.27	273	27	8,393	5·66	474·82	250	399

* Sold before completion of test.

STANDARD HERD TEST—*continued.*

Owner.	No. Completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
O. J. Syme, Macedon	7	7	Friesian	Bainfield Topsy 13th ..	Mature	6212	7.10.27	273	28½	14,997	3·39	508·23	350	593, 624, 635
				Bolobek Salome	Jr. 2 yrs.	2365	19.10.27	273	30	13,112	3·40	445·71	200	
				Burnside Korndyke Riversdale	Mature	1224	7.11.27	273	36	17,693	2·55	451·07	350	393, 469, 555, 519
				Bolobek Anne	Mature	338	27.11.27	273	40½	16,268	3·64	592·40	350	358, 378, 457, 522, 604, 601
				Bolobek Toplass	Jr. 2 yrs.	2367	28.11.27	273	21½	6,663	3·40	226·56	200	
				Bainfield Netherland Sylvia 2nd	Mature	1455	29.11.27	273	50	19,365	3·18	615·89	350	459, 746
				Bainfield Sylvia Topsy 2nd ..	Mature	1458	9.12.27	273	27	10,526	3·68	387·68	350	479, 371
G. Taylor, Caldermeade	2	..	Ayrshire	Alvanvale Snowdrop ..	Jr. 4 yrs.	14862	15.10.27	273	9½	5,204	4·07	211·90	300	
				Hilda 2nd of Ellerslie ..	Mature	12612	26.12.27	240	10	5,190	3·92	203·67	350	
Telford Bros., Kyabram	1	1	Ayrshire	Hyde Park Lady Doris ..	Jr. 2 yrs.	13656	7.10.27	273	19	7,047	4·21	296·75	200	
F. Trevaskis, Tongala	1	1	Jersey	Model 2nd of Ballara ..	Jr. 2 yrs.	21712	1.10.27	273	14½	5,696	5·15	293·45	200	
J. F. Tuckey, Alberton	1	..	Ayrshire	Irene of Tregorland ..	Mature	14265	4.10.27	240	4	7,335	4·22	309·67	350	300, 262, 184
J. T. Tweddle, Clyde	5	..	Friesian	Burnbank Inka Segis Catriona	Jr. 4 yrs.	1809	26.10.27	210	4	5,100	3·65	186·25	300	233, 273
				Winlaton Jean De Kol ..	Mature	1440	1.11.27	273	5½	5,810	3·21	186·38	350	159, 259, 251
				Royburn Muller Alcartra ..	Sr. 3 yrs.	1984	6.11.27	273	18	7,166	2·96	212·47	275	192, 268
				Ashlynn 25th	Mature	1076	14.11.27	273	14	7,193	3·13	225·20	350	292, 252, 330, 325, 297
				Burnbank Queen Patch ..	Mature	733	5.12.27	273	31½	7,553	3·22	243·00	350	259, 345, 338, 163

Standard Herd Test—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
J. T. Tweddle, Sunbury	5	4	Friesian	Westmere Pontiac Ormsby ..	Mature	1715	11.10.27	273	14	7,735	3·30	255·05	350	275, 198
				Burnbank Inka Sylvia Bainfield	Jr. 4 yrs.	1813	12.10.27	273	17	9,687	3·44	332·84	300	225
				Burnbank Inka Sylvia Violet	Mature	1106	20.10.27	273	7	12,090	3·42	414·05	350	297, 400, 578, 447, 476
				Winlaton Jessie Burkeyje ..	Jr. 2 yrs.	Vol. 9	30.10.27	273	23	7,595	3·47	263·30	200	
				Burnbank Muller Patch ..	Mature	1817	11.12.27	273	33	13,112	3·35	438·73	350	376, 334, 390
E. J. Vagg, Leongatha	5	5	Jersey ..	Beauty 2nd of Queen's Vale ..	Sr. 2 yrs.	19962	23.10.27	273	23	7,619	4·63	353·10	225	
				Bonnay Rubybell	Jr. 2 yrs.	Vol. 15	18.11.27	273	16	6,480	4·94	320·35	200	
				Lady of Queen's Vale ..	Jr. 3 yrs.	19963	15.12.27	273	23	7,551	5·71	431·28	250	
				Bonnay Mystery Maid ..	Jr. 2 yrs.	Vol. 15	17.12.27	273	19	6,125	5·62	344·32	200	
				Carrie 4th of Queen's Vale ..	Jr. 3 yrs.	21720	24.12.27	273	15	4,605	6·53	300·84	250	
C. Wade, Camperdown	5	4	Jersey ..	Beatrice of Merivale ..	Mature	15642	30.9.27	273	20	8,940	4·88	436·01	350	337, 380, 458
				Starbright of Colac	Sr. 2 yrs.	21730	30.9.27	273	19½	6,989	5·12	357·64	225	308
				Beatrice 3rd of Merivale ..	Sr. 2 yrs.	21726	19.10.27	273	14½	5,564	4·61	256·36	225	
				Frost 2nd of Kameruka ..	Mature	10339	30.10.27	240*	10½	5,355	5·15	275·65	350	
				Beatrice 2nd of Merivale ..	Jr. 2 yrs.	21725	25.11.27	273	14	5,543	5·25	290·86	200	
A. Wallace, Bendigo	1	1	Ayrshire	Victoria of Glen Cooee ..	Mature	9888	16.10.27	273	16	9,421	4·47	421·21	350	394
Walsh Bros., Templestowe	1	..	Red Poll	Gipps Elaine	Sr. 3 yrs.	1280B	1.10.27	273	8	6,354	3·71	235·56	275	167, 255
Warragul High School, Warragul	3	2	Red Poll	Gipps Vivien	Jr. 3 yrs.	1236	27.10.27	273	11	6,368	3·74	238·07	250	198
				Victoria Highland Fling ..	Mature	915C	7.12.27	273	41	13,893	3·96	550·81	350	346, 310, 406, 511, 509
				Gipps Alsace	Sr. 2 yrs.	..	22.12.27	273	12	5,714	4·37	249·58	225	

* Calved prematurely.

Standard Herd Test—*continued.*

Owner.	No. Completed Test.	No. Certificated.	Breed.	Name of Cow.	Age Standard.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
									lb.	lb.		lb.	lb.	
H. L. Webb, Sunbury	3	1	Ayrshire	Norma of Holly Green ..	Sr. 2 yrs.	14270	5.10.27	273	16	6,426	4·29	275·68	225	
				Marita of Holly Green ..	Jr. 2 yrs.	15628	11.11.27	273	5	3,390	4·65	157·70	200	
				Connie of Glen Locksley ..	Mature	7979	13.12.27	273	21½	8,183	3·95	322·87	350	335
W. O. Westlake, Portland	1	1	Jersey ..	Pansy of Grangelea.. ..	Jr. 3 yrs.	18649	1.12.27	273	..	6,938	4·94	342·80	250	347
R. S. Williams, Kongwak	1	1	Jersey ..	Bright Eyes of Linga Longa..	Sr. 2 yrs.	21111	25.10.27	240	4	4,095	6·30	257·90	225	207
A. C. Willis, Paschendale	1	..	Jersey ..	Molly 9th of Banyule ..	Mature	9500	20.10.27	273	12½	6,141	4·89	300·35	350	290
J. V. M. Wood, Heidelberg	5	3	Jersey ..	Woodside Primrose Day Lady 2nd	Jr. 2 yrs.	Vol. 15	28.9.27	273	11½	4,005	4·55	182·10	200	
				Araleun Felicity	Sr. 2 yrs.	Vol. 15	4.10.27	273	24½	8,525	4·83	411·87	225	
				Araleun Margot	Jr. 2 yrs.	21770	14.10.27	273	17½	6,503	4·89	317·70	200	
				Werribee Pancy Clementine 4th	Jr. 2 yrs.	Vol. 15	15.10.27	273	14	5,513	5·68	313·04	200	
				Chloe of Clarendon Eyre ..	Mature	9572	2.12.27	273	13½	5,927	4·61	273·36	350	229
W. Woodmason, Oakleigh	4	3	Jersey ..	Gipsy Love of Woodside ..	Mature	11257	2.10.27	273	21	7,928	4·02	319·01	350	259, 324, 247, 344
				Blossom 7th of Melrose ..	Sr. 3 yrs.	17880	10.10.27	273	14½	6,679	6·08	405·76	275	278, 364
				Jenny Lind 20th of Melrose ..	Jr. 4 yrs.	17514	13.10.27	273	12	4,760	6·58	313·24	300	212, 275
				Jessie 43rd of Melrose ..	Jr. 4 yrs.	19036	6.12.27	240	4	5,820	6·32	368·06	300	298, 361

THE WORLD WHEAT SITUATION.

The following interesting statement in regard to the world wheat situation has been published by the Canadian Bank of Commerce in its monthly commercial notes for October, 1928:—

"It now seems certain that the world will have this year the largest quantity of wheat, its capital food stuff, ever harvested and, owing to the improvement in quality in the crops of several countries, will have better bread than in 1927, especially if the Canadian crop, which sets the standard, is gathered in good condition. There is also the prospect that international trade in wheat will be of greater volume than ever before, as the present situation indicates exports by surplus-producing countries exceeding, possibly, by 100,000,000 bushels, those of the 1927-28 season, which were about 800,000,000 bushels.

Europe, including Russia, appears to have a slightly larger supply of home-grown wheat than in 1927. Weather conditions during the harvest have been variable, resulting in some lowering of quality, but the general grade is reported as good. However, Great Britain, Belgium and Germany, three of the principal importing countries, are likely to have smaller than average crops. France, also a large importer, is thought to have a crop about equal to that of 1927, while Italy will probably have 30,000,000 to 40,000,000 bushels more, and, therefore, both countries will be less dependent than formerly on the surplus-producing countries. It is probable that the Danubian countries will have a greater surplus over their normal consumption than in most former years, but this should not have any marked effect on the market. Russia, with a crop reported as about equal to that of last year, is not expected to be an exporter on a large scale as the yields are disappointing in the districts from which exports are drawn.

Argentina increased its acreage about five per cent. over last year and Australia by 1,500,000 acres. Planting and growing conditions have been favorable in both countries, but the weather from now until the harvest in December will exercise a greater influence than so far experienced. The Argentina crop has grown so rapidly that the frost hazard is greater than usual. Unless the Australian crop suffers severe damage during the remainder of the growing season it will be at least 50,000,000 bushels larger than in 1927, when production was comparatively small owing to drought. The North African crops, which normally furnish a small exportable surplus, will, it is thought, yield about the same quantity as a year ago, while India will be able to spare much, if any, wheat for other countries from her less than average crop. The Oriental market for wheat will probably be strong, because of settled conditions in China and Japan, this factor more than offsetting a large crop in Manchuria.

The abnormal quantity of wheat grown this year in the United States, officially estimated at 901,000,000 bushels, may not have any more effect on the world market than did the crop of 1927. The hard red winter wheat, which shows the greatest increase over 1927, forms the largest part of the exportable surplus, and as it is not of as good quality as was harvested last year it should not be in keen demand by European millers, especially in view of the quantity of superior Canadian wheat now in prospect, a conclusion borne out by a decrease of about 50 per cent. since 1st July in shipments to importing countries, as compared

with those during the first three months of the preceding season. A few weeks ago the United States Department of Agriculture suggested a total export movement of 150,000,000 bushels of all classes of wheat, this figure including 20,000,000 bushels of durum, most of which would go to Italy for the macaroni mills.

Canada, with a record crop, officially estimated as 550,482,000 bushels, will play an even more important role in international trade than in recent years, when she has furnished about 35 per cent. of the world's exportable surplus, outdistancing her closest competitor, the United States, by 10 or 15 per cent. Experience has shown that the world turns first to Canadian wheat and, as its needs will be greater, we can safely assume that it will purchase more than in any previous year. It should be understood that the Canadian sales agencies are now so well organized that orderly marketing can be maintained, and, therefore, that the market will not be altogether controlled by the buyers. Furthermore, a certain loss in grade of wheat and oats resulting from recent frosts and rains means that the farmers will retain part of their wheat for feed."

ORCHARD AND GARDEN NOTES.

E. E. Pescott, F.L.S., Pomologist.

The Orchard.

As a preventive against codlin moth, apple and pear trees should be sprayed with arsenate of lead whenever there is danger from the prevalence of the moth. One of the secrets of success in codlin moth spraying is the destruction of as many as possible of the insects of the first brood. Thus, if particular care is given to the early sprayings, keeping the fruit covered with spray for a month or six weeks after setting, this result is easily accomplished. Some growers prefer to gather all fruit infected by the first brood, spraying only for the second and later broods. Even if all the fruits attacked are gathered, which very rarely happens, the grower suffers from the loss of fruit, which he can ill afford, unless his crop be a heavy one.

Another feature for consideration is the fact that the presence of any arsenical spray on the foliage is responsible for the destruction of the pear and cherry slug, root-borer beetle, and all forms of leaf-eating insects.

Spraying the cherries for the slug will now be necessary. Arsenate of lead may be used, provided the fruit is not far advanced. Hellebore, and also tobacco water, are effective against this pest.

Cultivation.

All orchard soils should be kept well worked during the summer months. It is very essential that the trees should have an abundant supply of moisture during the whole of the growing season. This will mean an increased supply of fruit buds for the next season, consequently the frequent summer cultivation of the soil will be a necessity if the health and vigour of the trees are to be maintained.

Excessive transpiration is often the cause of loss of young trees and of new grafts. They are found to part with a large amount of moisture, and are not able to obtain or retain sufficient for their nourishment: they then very soon wither and die. The soil around these should always be kept well stirred; they may also be given a good straw or grass mulching, and an occasional overhead sprinkling will greatly benefit them.

The planting out of citrus trees may be continued, sheltering the tender plants from winds with hessian or breaks of scrub.

The general aims in summer cultivation should be to maintain a good loose earth mulch during the whole season, and to keep down all weeds and useless orchard growths.

Pruning.

Summer pruning may now be commenced, particularly on apple, pear, and plum trees. The removal or reduction of surplus leader growths, the shortening of unduly long laterals, and the thinning out of crowded shoots, will all tend to strengthen other parts of the tree and to increase the development of new fruit buds.

The Vegetable Garden.

Tomatoes will require much attention at this time of the year. If the plants have been well looked after, they should be making vigorous growth. It will be to advantage to tie the plants to stakes, training them to two or three main growths, and pinching out all laterals as they come.

The plants should be well watered, and occasionally a handful of bonedust or potash mixed should be forked in around the roots. Where stable manure is used, it should be used as a mulch, forking it in every three or four weeks, and making a fresh mulch.

It is now recommended that occasional doses of sulphate of potash as a manure for tomatoes will help the plants to resist the spotted wilt.

All plants of the cucumber and melon family should now be constantly supplied with ample water. Pinch out unnecessary lateral growths, and also the terminals.

The following seeds may now be sown:—French beans, cabbage and cauliflower for winter crops, parsnip, lettuce, and celery.

The side shoots of celery plants should be removed, afterwards earthing up the plants. Asparagus beds should be top-dressed, and allowed to grow without any more cutting. The vegetable beds will need frequent forking and hoeing to keep the soil sweet, and to keep down all weeds.

The Flower Garden.

Plant out dahlias this month; green plants early, and plants grown from tubers later in the month. Water well at planting, and keep well cultivated afterwards.

Rose bushes and beds may be given a good mulch with light stable manure, straw, grass, or lawn clippings. The beds should be kept rather dry, so as to allow the plants to rest before the autumn period of growth.

Sow seeds of cosmos, asters, zinnia, balsams, cockscomb, coreopsis, salpiglossis, and other late summer and autumn blooming annuals.

Cut down delphiniums that have yielded their first crop of flowers, so as to allow a succession of flowers to come.

Daffodil, hyacinth, tulip, ranunculus, anemone, and other bulbs and tubers may be taken up and stored; while gladioli corms may still be planted.

The garden must be kept well watered and cultivated, so as to tide the plants over the hot and dry season.

REMINDERS FOR JANUARY.

LIVE STOCK.

Horses.—*Stabled.*—Over-stimulating and fattening foods should be restricted. Water should be allowed at frequent intervals. Rub down on coming into stables in an overheated condition. Supply a ration of greenstuff, where possible, to all horses. *Brood mares* should be well fed on succulent food if available; otherwise, oats and bran should be given. *Foals* may with advantage be given oats to the extent of 1 lb. for each month of age daily. Provision should be made for shade shelter for paddocked horses.

Cattle.—Provide succulent fodder and plenty of clean water and shade. Japanese millet makes good grazing when the grass is dry. There should always be a supply of silage. The silo may be filled twice a year, and so a supply of succulent fodder is always available. Provide "lick" in trough, consisting of salt 40 lb., bone flour 20 lb., sulphur 15 lb., lime 25 lb., potassium iodide 5 oz. Limewash the cow bails, it helps to keep down flies. Provide calves, if possible, with good grass run, or lucerne hay or oats in a trough. Now that the Dairy Produce Act is in operation, it is necessary to take proper care of milk and cream, as it must be paid for according to its quality. Utensils must be kept clean and well tinned. Cream must be cooled and kept cool and delivered fresh to the factory. Write to the Department of Agriculture for "Don'ts for Dairymen."

Pigs.—Supply short bedding in well-ventilated styes. Keep styes clean and dry, and feeding troughs clean and wholesome. Sows suckling young should be well fed to enable them to produce plenty of milk. Give young pigs pollard and skim milk in separate trough as soon as they will take it, and keep them fattening from the start to get them off as early as possible. Give a tablespoonful of bone meal per 100 lb. live weight in food daily. If pigs are lousy, dress with kerosene emulsion or sulphur and lard, rubbing well into crevices of skin, and disinfect styes. Plenty of water should be available for them to wallow in in hot weather, also clean water to drink.

The automatic feeder described and illustrated in Bulletin 16 is proving a great success, and should be adopted in connexion with grazing.

Sheep.—The various breeds of ewes come in season approximately as follows:—Merinoes and comebacks, November and December; crossbreds, January and February; pure British breeds, February and March. These dates will vary with the locality, e.g., in the north of Victoria ewes generally come in season from one month to six weeks earlier than in the south-western districts or in South Gippsland. Be sure that there are ample rams, that is to say, from 2 to 3 per cent. If possible, use 2, 4, or 6-tooth rams. If older rams are used, it is preferable to join them with young ewes, and rams should be in proportion of 3 per cent. Always select rams from a registered flock with width and substance, true to breed, with type and wool qualities pronounced. (Do not use crossbred or mongrel rams. Pure-bred rams will produce better lambs.) If an ample number of rams be

available, use the best first and the seconds afterwards. The mating period should not exceed eight weeks. It is well to have fresh rams after the first five weeks. The ewes should be in good condition at mating time, but not too fat. To start the rams working, yard the ewes with the rams for a few nights at the outset of joining. The ewes will come into season much quicker if flushed with good food just before joining the rams.

Breed from only good-fleeced, roomy, and sound-mouthed ewes. Keep in view wool-production as well as a good-shaped carcass. Lamb, mutton, and wool will be amongst the foremost commodities in Australia for some time to come, and with the prices ruling for these products at present, every sheep-owner should make determined efforts to improve his flock Two-tooth ewes, if well-grown, may be bred from; this particularly applies to crossbreds and pure English sheep; also to the two-tooth ewes of a Merino flock if they are large enough, but they must be well treated throughout.

The second dipping of tick and louse infected sheep should be undertaken during January, but care should be taken not to dip during very hot weather.

Where the grass is dry and hard, all ewes that are hollow and "off their feed" should be given a purgative drench or pill. If weaners are scouring, worm-pill or drench should be given. Grown sheep showing unhealthy discharge should be given a worm drench.

To make a suitable drench, dissolve 8 oz. of bluestone in 4 gallons of water The following doses may be given:—

Adult sheep	2 oz. of solution.
Yearlings	1½ oz. of solution and ½ oz. water.
Six months	1 oz. solution and 1 oz. water.
Lambs	½ oz. solution and 1½ oz. water.

Attend to health of sheep generally. Do not overstock. Ensure an ample fresh-water supply. Healthy well-fed sheep rarely get fly-blown.

POULTRY.—Separate the sexes; the cockerels should now be fattened and marketed. Grade the young stock according to age and size, otherwise the younger birds will not thrive. Avoid overcrowding. Do not force pullets too much with animal food; build them up with a good variety of food, and give but little meat. Increase the green food; thoroughly spray houses and perches with an emulsion of kerosene and soapsuds, or a solution of carbolic acid 1 in 60. Keep water vessels in shady spot, and renew water twice daily.

BEE-KEEPING.

January being usually the hottest month of the year, combs may melt down on very hot days in hives made out of cases unless they are in some way shaded during the hottest part of the day. If bags are used, they should be removed again as soon as the hot weather is over, because they afford hiding places for bee moths, spiders, and other enemies of bees.

With factory-made or other hives, the walls, cover, and floor of which are of timber not less than ¾ inch in thickness, there is no need to provide artificial shade, provided the entrance is of sufficient width and the hive of ample capacity to accommodate the bees. The ordinary entrance, which is 5-16 inch deep and the width of the hive, is generally sufficient. It may, however, be enlarged by raising the hive another ¼ inch or so in front should there be much clustering out of the bees.

Top ventilation should not be given; it is not necessary, and the bees dislike it. Bees control the temperature inside the hive by fanning at the entrance and by moistening the combs with water.

During this and the next month bees generally supersede queens in their third year, or which are failing during the second. Queens are sometimes still quite prolific, but by some means the bees know that they would not live through the coming winter, and that it is necessary to raise a successor while drones are still flying, so that the young queen may not remain unfertilized. The queen-cells, which bees construct when superseding, are few—one or two, rarely more.

They are generally built on the face of one of the outer combs, often one containing no other brood—not on the edge of a brood comb, as in the case of swarm cells.

Supersedure queen cells must not be mistaken for swarm cells and destroyed, otherwise the hive may eventually become queenless.

All colonies should be examined to see that each has a laying queen. It sometimes happens that the virgin queen of a swarmed stock is lost on her mating flight, and as there is then no young brood in the hive from which to raise another queen, the colony becomes hopelessly queenless. Therefore, whenever neither young brood nor eggs are seen in a hive, a comb of young brood or eggs from some other colony should be given to the bees. If, on examination a few days later, queen-cells have not been raised, then there is a virgin queen in the hive which may be expected to commence laying within a fortnight at the outside.

CULTIVATION.

Farm.—Get all crops harvested and stacked as soon as possible. Horse-hoe maize, potatoes and other summer crops. See to insurance of stacks of grain and hay.

Vineyard.—Summer bud or *Yema* grafting may be practised in January, though February is the usual month. (See Bulletin No. 35, obtainable on application.) This is the slackest month in un-irrigated vineyards—all ordinary work should be completed before Christmas. It is only exceptional operations, such as cultivating after rain, sulphuring in case of odium, or spraying for downy mildew, that must be carried out. Should heavy rain fall it will be necessary to repeat spraying in order to insure adequate protection. The final spraying, to protect foliage, and thus enable fruit to ripen under normal conditions, should be applied in January; the exact date will depend on the weather. In irrigated vineyards the application of water, and the cultivation it necessitates, require attention. Make it a rule to spray immediately *before* watering.

Cellar.—Fill up regularly and keep cellar as cool as possible. Towards end of month commence to make preparations for the coming vintage.

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Sow 15 to 25 lbs. per acre broadcast, or 7 lbs. in drills. **6d.** lb.; **50/-** cwt.

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(Planter's Friend)

Sow 12 lbs. per acre in drills; 18 to 20 lbs. broadcast. **6d.** lb.; **50/-** cwt.

JAPANESE MILLET

Sow 10 lbs. per acre in drills; 20 lbs. broadcast. **2d.** lb.; **17/6** cwt.; **£16** ton in ¼ ton lots or more.

SORGHUM SACCHARATUM

Sow 14 lbs. per acre broadcast, or 7 lbs. in drills; **6d.** lb.; **50/-** cwt.

Early Ambercane

Sow 7 lbs. per acre in drills; 14 lbs. broadcast. **6d.** lb.; **50/-** cwt.

LUCERNE

(Sow 8 to 10 lbs. per acre in drills, or 20 lbs. broadcast)

HUNTER RIVER ("Pilca-Butta" Strain), 3/- lb.; **2/10** lb. in cwt. lots or more. **Ordinary Machine-cleaned** (guaranteed broad leaf N.S.W. grown), **2/10** lb.; **2/9** lb. in cwt. lots or more.

FRENCH PROVENCE (True), 2/3 lb.; **2/-** lb. in ¼ cwt. lots or more.

NEW ZEALAND (Celebrated Marlborough Strain), 2/4 lb.; **2/3** lb. in cwt. lots or more.

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Dwarf Essex—Imported English (true) **8d.** lb.; **65/4** cwt.; Imported Dutch, **7d.** lb.; **60/-** cwt.; New Zealand, **7d.** lb.; **60/-** cwt.

White Mustard—Sow with Rape at the rate of 1 to 2 lbs. per acre, as it prevents blowing. **1/6** lb.; **150/-** cwt.

Sheep's Parsley—**2/6** lb.

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DEPARTMENT OF AGRICULTURE, VICTORIA

Red Poll Dairy Herd

The Department has now completed the orders for calves that were booked ahead of calving when the advertisement was withdrawn; consequently the booking of orders for bull calves from the forthcoming calvings has now been resumed.

BULL CALVES are sold for delivery at a month old at prices based approximately on the actual milk and butter fat record of the dam at the rate of 1s. per lb. of butter ***fat*** yielded. Thus a calf from a cow with a 400 lb. butter fat record is sold for 20 guineas, one from a 300 lb. butter fat cow for 15 guineas, and so on. Bull Calves *ex* heifers on their first calf are sold for a set price of 10 guineas.

(For Record of Yields of dams see Red Poll Herd Book.)

SIRES IN USE:

VICTORIA VOLCANO (322 A.)

Sire: Nicotine (69 A.A.) by Acton Dewstone (imp.) 9524 (4 A.A.).
Dam: Tonga (253 A.) by Honingham Archbishop (imp.) 9702 (48 A.A.).

Tonga's butter fat yields for 6 successive lactation periods are as follow:—1916, 341 lb.; 1917, 398 lb.; 1918, 419 lb.; 1919, 479 lb.; 1920, 428 lb.; 1921, 562 lb.

BELLIGERENT (Imported) 11096 (8 A.A.)

Dam's Record (1st milking) 7144 lb. milk.

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Sire's D. Dam's	,,	9510	,,	... 12	,,	,,	8033 ,,
G. Sire's D. Dam's	,,	10215	,,	... 7	,,	,,	9386 ,,
G.G. Sire's D. Dam's	,,	12565	,,	... 10	,,	,,	8853 ,,
G.G.G. Sire's D. Dam's	,,	10088	,,	... 2	,,	,,	9754 ,,

BIT O' 'BACCA (Vol. 3)

Sire: Nicotine (69 A.A.) by Acton Dewstone (imp.) 9524 (4 A.A.).
Dam: Nictitana (311 B.) by Nicotine (69 A.A.).

Nictitana's butter fat records for 6 successive lactation periods are as follow:—1918, 450 lb.; 1919, 396 lb.; 1920, 393 lb.; 1921, 465 lb.; 1922, 524 lb.; 1923, 536 lb.

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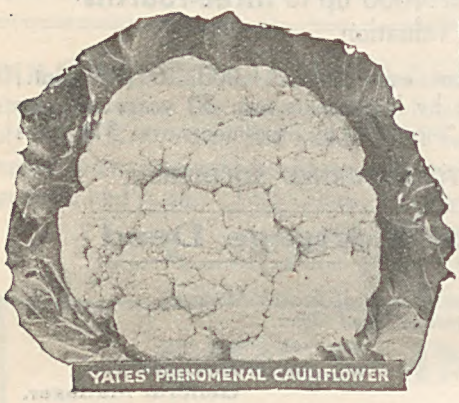

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